



# COMUNE DI SANTA MARIA A MONTE

## Spazio insieme zerocentoventi San Sebastiano

### PROGETTO DEFINITIVO/ESECUTIVO

(redatto ai sensi del D.Lgs. 50/2016 e s.m.i.)

Strutturale

RESPONSABILE UNICO DEL PROCEDIMENTO:

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PROGETTAZIONE IMPIANTI:

STUDIO MPS

Progettazione impianti TERMOMECCANICI:

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Progettazione impianti ELETTRICI E SPECIALI:

P.I. Yuri DEMI

CODICE FILE

ES\_18\_06\_DE\_L1\_S\_D08

CONTENUTO FILE:

- Verifica Stabilità Versante

DATA :

OTTOBRE 2020

# **VERIFICA DI STABILITA' DEL VERSANTE**

**STATO ATTUALE**

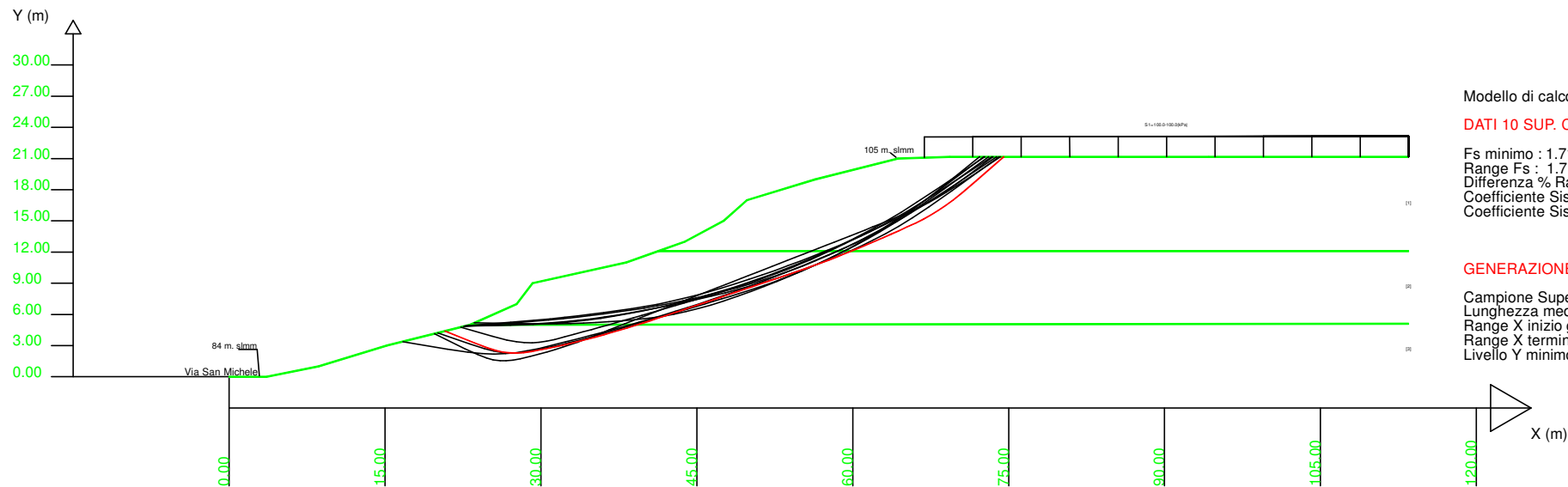
SSAP 5.0 (2020) - Slope Stability Analysis Program  
 Software by Dr.Geol. L.Borselli - www.lorenzo-borselli.eu  
 SSAP/DXF generator rel. 2.0 (2020)

Data : 10/11/2020  
 Localita' : San Sebastiano - S.Maria a Monte  
 Descrizione : Verifica di stabilita del pendio stato attuale in condizioni statiche drenate  
 [n] = N. strato o lente

Sn --> Sovraccarico

# Parametri Geotecnici degli strati # -----

N.	phi°	C`	Cu	Gamm	GammSat	sgci	GSI	mi	D
..	deg	kPa	kPa	kN/m3	kN/m3	MPa	..	..	..
1	22.00	25.00	0	19.50	20.00	0	0	0	0
2	26.00	7.00	0	21.50	21.50	0	0	0	0
3	30.00	7.00	0	20.00	20.00	0	0	0	0



Modello di calcolo : Morgenstern - Price (1965)

DATI 10 SUP. CON MINOR Fs

Fs minimo : 1.7121  
 Range Fs : 1.7121 - 1.7256  
 Differenza % Range Fs : 0.78  
 Coefficiente Sismico orizzontale - Kh: 0.0000  
 Coefficiente Sismico verticale - Kv: 0.0000

GENERAZIONE SUPERFICI RANDOM

Campione Superfici - N.: 10000  
 Lunghezza media segmenti (m) : 4.5  
 Range X inizio generazione : 2.3 - 25.7  
 Range X termine generazione : 54.0 - 111.2  
 Livello Y minimo considerato : 0.0

# Report elaborazioni #

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SSAP 5.0 - Slope Stability Analysis Program (1991,2020)

WWW.SSAP.EU

Build No. 11716

BY

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\*\* Gia' Ricercatore CNR-IRPI fino a Luglio 2011

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Ultima Revisione struttura tabelle del report: 12 settembre 2020  
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File report: D:\ssp2010prove\lavori\smontemuro\versante\verifiche\attuale statico.txt

Data: 10/11/2020

Localita' : San Sebastiano - S.Maria a Monte

Descrizione: Verifica di stabilit  del pendio stato attuale in condizioni statiche drenate

Modello pendio: ATTUALE.mod

----- PARAMETRI DEL MODELLO DEL PENDIO -----

\_\_\_ PARAMETRI GEOMETRICI - Coordinate X Y (in m) \_\_\_

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	0.00	41.28	12.09	23.18	5.00	-	-
3.60	0.00	113.48	12.09	113.48	5.11	-	-
8.62	1.00	-	-	-	-	-	-
15.21	3.00	-	-	-	-	-	-
23.18	5.00	-	-	-	-	-	-
27.66	7.00	-	-	-	-	-	-
29.20	9.00	-	-	-	-	-	-
38.23	11.00	-	-	-	-	-	-
41.28	12.09	-	-	-	-	-	-
43.84	13.00	-	-	-	-	-	-
47.59	15.00	-	-	-	-	-	-
49.82	17.00	-	-	-	-	-	-
56.39	19.00	-	-	-	-	-	-
64.37	21.00	-	-	-	-	-	-
66.92	21.09	-	-	-	-	-	-
69.36	21.17	-	-	-	-	-	-
94.25	21.17	-	-	-	-	-	-
113.48	21.17	-	-	-	-	-	-

## ASSENZA DI FALDA ##

----- PARAMETRI GEOMECCANICI -----

fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
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STRATO 1	22.00	25.00	0.00	19.50	20.00	2.277	0.00	0.00	0.00	0.00
STRATO 2	26.00	7.00	0.00	21.50	21.50	1.718	0.00	0.00	0.00	0.00
STRATO 3	30.00	7.00	0.00	20.00	20.00	2.091	0.00	0.00	0.00	0.00

LEGENDA: fi` \_\_\_\_\_ Angolo di attrito interno efficace(in gradi)  
 C` \_\_\_\_\_ Coesione efficace (in Kpa)  
 Cu \_\_\_\_\_ Resistenza al taglio Non drenata (in Kpa)  
 Gamm \_\_\_\_\_ Peso di volume terreno fuori falda (in KN/m^3)  
 Gamm\_sat \_\_\_\_\_ Peso di volume terreno immerso (in KN/m^3)  
 STR\_IDX \_\_\_\_\_ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)  
 ---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)-  
 sigci \_\_\_\_\_ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)  
 GSI \_\_\_\_\_ Geological Strenght Index ammasso(adimensionale)  
 mi \_\_\_\_\_ Indice litologico ammasso(adimensionale)  
 D \_\_\_\_\_ Fattore di disturbo ammasso(adimensionale)  
 Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)  
 Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

----- SOVRACCARICHI PRESENTI -----

SOVRACCARICO N.1

Carico in X1 (Kpa): 100.00  
 Carico in X2 (Kpa): 100.00  
 Posizione carico da X1 m.: 66.9000  
 a X2 m.: 113.4800  
 Inclinazione carico (gradi): 90.00  
 Componenti distribuzione forza unitaria applicata:  
 #Orizzontale (per metro di proiezione Verticale) (kN/m): da 0.00 a 0.00  
 #Verticale (per metro di proiezione Orizzontale) (kN/m): da 100.00 a 100.00  
 ##Nota: la distribuzione del carico e delle forze unitarie puo' variare  
 in modo lineare tra gli estremi di coordinate X1 e X2

----- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM -----

\*\*\* PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI  
 METODO DI RICERCA: CONVEX RANDOM - Chen (1992)  
 FILTRAGGIO SUPERFICI : ATTIVATO  
 COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00  
 LUNGHEZZA MEDIA SEGMENTI (m): 4.5 (+/-) 50%  
 INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 2.27 25.70  
 LIVELLO MINIMO CONSIDERATO (Ymin): 0.00  
 INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 54.00 111.21  
 \*\*\* TOTALE SUPERFICI GENERATE : 10000

----- INFORMAZIONI PARAMETRI DI CALCOLO -----

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)  
 METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : A (rapido)  
 COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0000  
 COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0000  
 COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000  
 FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00

FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante le tutte le verifiche globali.

I valori >0 impostati dall'utente sono utilizzati solo in caso di verifica singola

----- RISULTATO FINALE ELABORAZIONI -----

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\* DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*

Fattore di sicurezza (FS)	1.7121	- Min. -	X	Y	Lambda=	0.4185
			20.76	4.39		
			23.58	3.25		
			24.87	2.77		
			25.71	2.51		
			26.39	2.37		
			27.08	2.29		
			27.68	2.28		
			28.35	2.33		
			29.08	2.43		
			29.99	2.60		
			30.81	2.76		
			31.59	2.92		
			32.34	3.09		
			33.08	3.26		
			33.81	3.44		
			34.55	3.63		
			35.29	3.83		
			36.07	4.04		
			36.83	4.26		
			37.57	4.48		
			38.31	4.70		
			39.05	4.92		
			39.79	5.16		
			40.53	5.39		
			41.27	5.64		
			42.03	5.89		
			42.78	6.14		
			43.53	6.39		
			44.28	6.64		
			45.03	6.89		
			45.78	7.14		
			46.53	7.39		
			47.27	7.64		
			48.02	7.89		
			48.76	8.14		
			49.51	8.39		
			50.26	8.64		
			51.00	8.89		
			51.76	9.15		
			52.51	9.40		
			53.26	9.65		

54.02	9.91
54.76	10.16
55.50	10.42
56.24	10.69
56.98	10.96
57.71	11.24
58.46	11.53
59.21	11.83
59.97	12.14
60.73	12.45
61.47	12.76
62.21	13.07
62.95	13.39
63.70	13.72
64.46	14.06
65.25	14.42
66.08	14.80
66.81	15.17
67.52	15.57
68.19	15.98
68.91	16.46
69.68	17.03
70.57	17.74
71.87	18.84
74.53	21.17

Fattore di sicurezza (FS)	1.7143	- N.2	--	X	Y	Lambda=	0.4241
				19.77	4.15		
				22.66	2.72		
				23.95	2.12		
				24.77	1.80		
				25.41	1.63		
				26.08	1.55		
				26.65	1.54		
				27.30	1.60		
				28.03	1.73		
				28.99	1.96		
				29.83	2.17		
				30.61	2.38		
				31.34	2.60		
				32.08	2.83		
				32.79	3.07		
				33.52	3.32		
				34.26	3.60		
				35.03	3.90		
				35.80	4.20		
				36.55	4.49		
				37.31	4.79		
				38.05	5.08		
				38.80	5.37		
				39.55	5.66		
				40.29	5.95		



41.03	6.24
41.78	6.53
42.53	6.82
43.28	7.12
44.02	7.41
44.77	7.70
45.52	7.99
46.26	8.28
47.00	8.57
47.75	8.86
48.50	9.15
49.25	9.44
49.99	9.73
50.74	10.03
51.48	10.32
52.23	10.61
52.97	10.90
53.72	11.19
54.47	11.48
55.21	11.77
55.96	12.06
56.71	12.36
57.46	12.65
58.21	12.94
58.95	13.23
59.70	13.53
60.44	13.82
61.18	14.12
61.93	14.42
62.68	14.72
63.44	15.03
64.22	15.35
65.04	15.68
65.77	16.01
66.48	16.36
67.16	16.72
67.89	17.14
68.66	17.64
69.55	18.25
70.85	19.19
73.49	21.17

Fattore di sicurezza (FS)	1.7163	- N.3	--	X	Y	Lambda=	0.4049
				22.67	4.87		
				27.13	5.01		
				29.37	5.10		
				30.94	5.19		
				32.32	5.29		
				33.59	5.42		
				34.82	5.57		
				36.08	5.74		
				37.37	5.94		

38.74	6.18
40.05	6.42
41.34	6.66
42.60	6.92
43.87	7.19
45.14	7.47
46.42	7.77
47.73	8.09
49.10	8.44
50.39	8.78
51.65	9.15
52.89	9.53
54.15	9.95
55.39	10.39
56.67	10.87
58.00	11.39
59.45	11.98
60.74	12.55
61.98	13.15
63.17	13.77
64.42	14.48
65.76	15.30
67.30	16.33
69.54	17.89
74.08	21.17

Fattore di sicurezza (FS)	1.7164	- N.4	--	X	Y	Lambda=	0.4270
				20.09	4.22		
				23.15	3.16		
				24.56	2.71		
				25.48	2.47		
				26.23	2.34		
				26.99	2.29		
				27.65	2.29		
				28.38	2.36		
				29.18	2.49		
				30.16	2.69		
				31.06	2.89		
				31.90	3.08		
				32.72	3.28		
				33.53	3.48		
				34.32	3.69		
				35.12	3.90		
				35.93	4.13		
				36.76	4.37		
				37.59	4.62		
				38.41	4.85		
				39.23	5.09		
				40.05	5.33		
				40.86	5.57		
				41.68	5.81		
				42.50	6.05		

43.31	6.28
44.12	6.52
44.94	6.76
45.75	7.00
46.56	7.25
47.38	7.49
48.20	7.74
49.03	8.00
49.88	8.26
50.69	8.52
51.48	8.79
52.27	9.07
53.07	9.37
53.86	9.68
54.67	10.01
55.50	10.36
56.37	10.75
57.20	11.13
58.00	11.51
58.79	11.90
59.59	12.32
60.38	12.75
61.18	13.21
62.01	13.69
62.89	14.22
63.72	14.74
64.52	15.27
65.30	15.80
66.11	16.36
66.98	17.01
67.98	17.77
69.40	18.90
72.22	21.17

Fattore di sicurezza (FS)	1.7176	- N.5	--	X	Y	Lambda=	0.4122
				23.59	5.18		
				27.84	5.11		
				30.01	5.09		
				31.53	5.10		
				32.88	5.12		
				34.10	5.16		
				35.31	5.22		
				36.55	5.30		
				37.84	5.39		
				39.22	5.51		
				40.45	5.64		
				41.64	5.81		
				42.78	6.02		
				43.99	6.27		
				45.13	6.56		
				46.33	6.89		
				47.57	7.29		

48.95	7.76
50.23	8.22
51.47	8.68
52.68	9.15
53.90	9.66
55.10	10.17
56.33	10.72
57.60	11.32
58.95	11.97
60.20	12.60
61.41	13.25
62.58	13.92
63.79	14.65
65.10	15.50
66.61	16.52
68.76	18.04
73.09	21.17

Fattore di sicurezza (FS)    1.7210   - N.6 --    X    Y    Lambda= 0.4120

22.53	4.84
26.92	5.15
29.16	5.32
30.75	5.46
32.16	5.59
33.43	5.73
34.70	5.88
35.97	6.04
37.28	6.21
38.63	6.41
39.92	6.61
41.18	6.82
42.43	7.06
43.69	7.31
44.94	7.59
46.21	7.89
47.52	8.22
48.92	8.58
50.21	8.95
51.47	9.34
52.69	9.74
53.95	10.19
55.18	10.66
56.44	11.17
57.75	11.72
59.17	12.36
60.47	12.97
61.73	13.60
62.95	14.24
64.21	14.94
65.58	15.75
67.13	16.73
69.37	18.19

73.84 21.17

Fattore di sicurezza (FS) 1.7212 - N.7 -- X Y Lambda= 0.4223

22.71	4.88
27.06	4.96
29.24	5.03
30.76	5.10
32.09	5.20
33.32	5.32
34.52	5.46
35.74	5.63
37.01	5.83
38.37	6.07
39.64	6.31
40.88	6.57
42.09	6.84
43.33	7.14
44.54	7.45
45.78	7.79
47.05	8.15
48.40	8.56
49.66	8.97
50.89	9.39
52.10	9.82
53.33	10.29
54.54	10.77
55.78	11.29
57.05	11.85
58.42	12.48
59.69	13.08
60.91	13.70
62.10	14.34
63.33	15.03
64.66	15.84
66.18	16.80
68.36	18.23
72.72	21.17

Fattore di sicurezza (FS) 1.7213 - N.8 -- X Y Lambda= 0.4156

22.78	4.90
27.10	5.24
29.31	5.42
30.88	5.57
32.27	5.71
33.53	5.85
34.78	6.00
36.05	6.17
37.35	6.34
38.70	6.54
39.96	6.75
41.20	6.98

42.40	7.23
43.64	7.51
44.85	7.82
46.09	8.15
47.36	8.53
48.72	8.95
50.02	9.37
51.28	9.80
52.52	10.23
53.77	10.69
55.01	11.16
56.28	11.65
57.58	12.17
58.96	12.75
60.22	13.30
61.45	13.88
62.64	14.48
63.88	15.15
65.22	15.92
66.75	16.85
68.96	18.26
73.39	21.17

Fattore di sicurezza (FS)    1.7217   - N.9 --    X    Y    Lambda= 0.4194

16.72	3.38
20.99	2.65
23.00	2.35
24.35	2.22
25.48	2.18
26.58	2.22
27.59	2.32
28.67	2.48
29.81	2.72
31.14	3.04
32.39	3.36
33.59	3.66
34.77	3.97
35.93	4.28
37.08	4.59
38.25	4.91
39.42	5.25
40.62	5.59
41.79	5.94
42.94	6.30
44.09	6.66
45.24	7.03
46.39	7.41
47.55	7.81
48.72	8.22
49.93	8.66
51.10	9.09
52.26	9.53

53.40	9.97
54.56	10.44
55.71	10.91
56.89	11.40
58.10	11.92
59.38	12.48
60.53	13.03
61.65	13.60
62.73	14.19
63.86	14.87
65.08	15.65
66.48	16.62
68.51	18.10
72.62	21.17

Fattore di sicurezza (FS)    1.7256 - N.10 --    X    Y    Lambda= 0.4105

22.28	4.77
25.33	3.90
26.74	3.54
27.65	3.36
28.39	3.28
29.15	3.27
29.81	3.31
30.54	3.42
31.33	3.59
32.29	3.84
33.18	4.08
34.03	4.31
34.86	4.54
35.67	4.76
36.48	4.99
37.29	5.22
38.10	5.45
38.91	5.68
39.73	5.92
40.54	6.15
41.35	6.39
42.16	6.62
42.98	6.86
43.80	7.10
44.62	7.33
45.44	7.57
46.25	7.81
47.05	8.06
47.85	8.30
48.65	8.56
49.46	8.83
50.27	9.10
51.09	9.38
51.95	9.68
52.76	9.97
53.56	10.28

54.34	10.59
55.14	10.92
55.93	11.26
56.72	11.62
57.53	11.99
58.36	12.39
59.19	12.78
60.01	13.18
60.83	13.57
61.64	13.95
62.46	14.35
63.28	14.74
64.12	15.14
64.96	15.54
65.76	15.94
66.55	16.35
67.33	16.78
68.13	17.23
69.00	17.76
69.99	18.38
71.41	19.30
74.22	21.17

----- ANALISI DEFICIT DI RESISTENZA -----

# DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*

# Analisi Deficit in riferimento a FS(progetto) = 1.100

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.712	4203.1	2454.9	1502.7	Surplus
2	1.714	3830.5	2234.5	1372.5	Surplus
3	1.716	3493.6	2035.6	1254.4	Surplus
4	1.716	3926.5	2287.6	1410.1	Surplus
5	1.718	3505.9	2041.2	1260.6	Surplus
6	1.721	3325.9	1932.5	1200.1	Surplus
7	1.721	3217.6	1869.4	1161.3	Surplus
8	1.721	3153.0	1831.7	1138.1	Surplus
9	1.722	3957.2	2298.5	1428.9	Surplus
10	1.726	3689.3	2138.0	1337.5	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 1138.1

Note: FTR --> Forza totale Resistente lungo la superficie di scivolamento

FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA rispetto al fronte della scarpata



TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi ' (°)	(c', Cu) (kPa)
20.757	0.444	-21.96	1.29	0.00	0.00	30.00	7.00
21.202	0.444	-21.96	3.88	0.00	0.00	30.00	7.00
21.646	0.444	-21.96	6.46	0.00	0.00	30.00	7.00
22.090	0.444	-21.96	9.04	0.00	0.00	30.00	7.00
22.535	0.444	-21.96	11.63	0.00	0.00	30.00	7.00
22.979	0.201	-21.96	6.10	0.00	0.00	30.00	7.00
23.180	0.401	-21.96	14.12	0.00	0.00	30.00	7.00
23.581	0.444	-20.51	18.92	0.00	0.00	30.00	7.00
24.025	0.444	-20.51	22.29	0.00	0.00	30.00	7.00
24.470	0.403	-20.51	23.11	0.00	0.00	30.00	7.00
24.872	0.444	-17.02	28.58	0.00	0.00	30.00	7.00
25.317	0.397	-17.02	28.16	0.00	0.00	30.00	7.00
25.714	0.444	-12.25	34.28	0.00	0.00	30.00	7.00
26.158	0.229	-12.25	18.75	0.00	0.00	30.00	7.00
26.387	0.444	-6.11	38.24	0.00	0.00	30.00	7.00
26.832	0.247	-6.11	22.30	0.00	0.00	30.00	7.00
27.079	0.444	-1.20	41.68	0.00	0.00	30.00	7.00
27.523	0.137	-1.20	13.21	0.00	0.00	30.00	7.00
27.660	0.019	-1.20	1.85	0.00	0.00	30.00	7.00
27.679	0.444	3.84	46.14	0.00	0.00	30.00	7.00
28.123	0.224	3.84	25.19	0.00	0.00	30.00	7.00
28.347	0.444	7.87	53.88	0.00	0.00	30.00	7.00
28.791	0.285	7.87	37.13	0.00	0.00	30.00	7.00
29.076	0.124	10.70	16.82	0.00	0.00	30.00	7.00
29.200	0.444	10.70	60.98	0.00	0.00	30.00	7.00
29.644	0.344	10.70	47.28	0.00	0.00	30.00	7.00
29.988	0.444	11.22	61.30	0.00	0.00	30.00	7.00
30.432	0.382	11.22	52.82	0.00	0.00	30.00	7.00
30.814	0.444	11.83	61.57	0.00	0.00	30.00	7.00
31.259	0.331	11.83	45.91	0.00	0.00	30.00	7.00
31.589	0.444	12.46	61.75	0.00	0.00	30.00	7.00
32.034	0.304	12.46	42.22	0.00	0.00	30.00	7.00
32.337	0.444	13.13	61.83	0.00	0.00	30.00	7.00
32.782	0.295	13.13	41.01	0.00	0.00	30.00	7.00
33.076	0.444	13.74	61.84	0.00	0.00	30.00	7.00
33.521	0.286	13.74	39.78	0.00	0.00	30.00	7.00
33.807	0.444	14.35	61.78	0.00	0.00	30.00	7.00
34.251	0.294	14.35	40.87	0.00	0.00	30.00	7.00
34.545	0.444	14.95	61.64	0.00	0.00	30.00	7.00
34.990	0.305	14.95	42.26	0.00	0.00	30.00	7.00
35.295	0.444	15.51	61.43	0.00	0.00	30.00	7.00
35.739	0.331	15.51	45.68	0.00	0.00	30.00	7.00
36.070	0.444	15.87	61.14	0.00	0.00	30.00	7.00
36.515	0.312	15.87	42.78	0.00	0.00	30.00	7.00
36.827	0.444	16.24	60.82	0.00	0.00	30.00	7.00
37.271	0.301	16.24	41.08	0.00	0.00	30.00	7.00
37.572	0.444	16.62	60.45	0.00	0.00	30.00	7.00
38.016	0.214	16.62	28.99	0.00	0.00	30.00	7.00

38.230	0.081	16.62	11.03	0.00	0.00	30.00	7.00
38.311	0.444	17.01	60.43	0.00	0.00	30.00	7.00
38.756	0.297	17.01	40.55	0.00	0.00	30.00	7.00
39.053	0.304	17.38	41.64	0.00	0.00	30.00	7.00
39.357	0.433	17.38	59.47	0.00	0.00	26.00	7.00
39.789	0.444	17.75	61.25	0.00	0.00	26.00	7.00
40.234	0.295	17.75	40.77	0.00	0.00	26.00	7.00
40.529	0.444	18.12	61.49	0.00	0.00	26.00	7.00
40.973	0.300	18.12	41.57	0.00	0.00	26.00	7.00
41.273	0.007	18.48	0.97	0.00	0.00	26.00	7.00
41.280	0.444	18.48	61.62	0.00	0.00	26.00	7.00
41.724	0.303	18.48	42.02	0.00	0.00	26.00	7.00
42.028	0.444	18.48	61.54	0.00	0.00	26.00	7.00
42.472	0.311	18.48	43.00	0.00	0.00	26.00	7.00
42.783	0.444	18.49	61.45	0.00	0.00	26.00	7.00
43.227	0.306	18.49	42.30	0.00	0.00	26.00	7.00
43.533	0.307	18.49	42.37	0.00	0.00	26.00	7.00
43.840	0.444	18.49	61.67	0.00	0.00	26.00	7.00
44.284	0.000	18.49	0.02	0.00	0.00	26.00	7.00
44.284	0.444	18.50	62.30	0.00	0.00	26.00	7.00
44.729	0.301	18.50	42.51	0.00	0.00	26.00	7.00
45.030	0.444	18.50	63.37	0.00	0.00	26.00	7.00
45.474	0.305	18.50	43.87	0.00	0.00	26.00	7.00
45.779	0.444	18.51	64.43	0.00	0.00	26.00	7.00
46.223	0.302	18.51	44.22	0.00	0.00	26.00	7.00
46.526	0.444	18.51	65.50	0.00	0.00	26.00	7.00
46.970	0.304	18.51	45.10	0.00	0.00	26.00	7.00
47.274	0.316	18.52	47.31	0.00	0.00	26.00	7.00
47.590	0.426	18.52	64.82	0.00	0.00	26.00	7.00
48.016	0.444	18.53	69.65	0.00	0.00	26.00	7.00
48.460	0.303	18.53	48.72	0.00	0.00	26.00	7.00
48.763	0.444	18.53	73.07	0.00	0.00	26.00	7.00
49.208	0.302	18.53	50.88	0.00	0.00	26.00	7.00
49.510	0.310	18.54	53.11	0.00	0.00	26.00	7.00
49.820	0.439	18.54	75.91	0.00	0.00	26.00	7.00
50.259	0.444	18.55	76.51	0.00	0.00	26.00	7.00
50.704	0.301	18.55	51.61	0.00	0.00	26.00	7.00
51.004	0.444	18.56	76.08	0.00	0.00	26.00	7.00
51.449	0.307	18.56	52.42	0.00	0.00	26.00	7.00
51.756	0.444	18.57	75.66	0.00	0.00	26.00	7.00
52.200	0.307	18.57	52.05	0.00	0.00	26.00	7.00
52.507	0.444	18.58	75.23	0.00	0.00	26.00	7.00
52.951	0.312	18.58	52.65	0.00	0.00	26.00	7.00
53.263	0.444	18.59	74.79	0.00	0.00	26.00	7.00
53.707	0.312	18.59	52.44	0.00	0.00	26.00	7.00
54.020	0.444	19.01	74.34	0.00	0.00	26.00	7.00
54.464	0.299	19.01	49.90	0.00	0.00	26.00	7.00
54.764	0.444	19.44	73.83	0.00	0.00	26.00	7.00
55.208	0.294	19.44	48.67	0.00	0.00	26.00	7.00
55.502	0.444	19.88	73.27	0.00	0.00	26.00	7.00
55.946	0.290	19.88	47.64	0.00	0.00	26.00	7.00
56.236	0.154	20.32	25.15	0.00	0.00	26.00	7.00
56.390	0.444	20.32	72.41	0.00	0.00	26.00	7.00

56.834	0.143	20.32	23.13	0.00	0.00	26.00	7.00
56.977	0.444	20.75	71.59	0.00	0.00	26.00	7.00
57.422	0.292	20.75	46.67	0.00	0.00	26.00	7.00
57.713	0.444	21.19	70.51	0.00	0.00	26.00	7.00
58.158	0.297	21.19	46.81	0.00	0.00	26.00	7.00
58.455	0.444	21.61	69.35	0.00	0.00	26.00	7.00
58.900	0.306	21.61	47.37	0.00	0.00	26.00	7.00
59.206	0.444	22.01	68.13	0.00	0.00	26.00	7.00
59.650	0.205	22.01	31.20	0.00	0.00	26.00	7.00
59.855	0.119	22.01	18.03	0.00	0.00	22.00	25.00
59.974	0.444	22.35	66.94	0.00	0.00	22.00	25.00
60.419	0.309	22.35	46.11	0.00	0.00	22.00	25.00
60.727	0.444	22.70	65.87	0.00	0.00	22.00	25.00
61.172	0.300	22.70	44.09	0.00	0.00	22.00	25.00
61.471	0.444	23.05	64.78	0.00	0.00	22.00	25.00
61.916	0.295	23.05	42.66	0.00	0.00	22.00	25.00
62.211	0.444	23.40	63.64	0.00	0.00	22.00	25.00
62.655	0.297	23.40	42.18	0.00	0.00	22.00	25.00
62.953	0.444	23.76	62.46	0.00	0.00	22.00	25.00
63.397	0.303	23.76	42.20	0.00	0.00	22.00	25.00
63.700	0.444	24.11	61.22	0.00	0.00	22.00	25.00
64.145	0.225	24.11	30.77	0.00	0.00	22.00	25.00
64.370	0.091	24.11	12.29	0.00	0.00	22.00	25.00
64.461	0.444	24.45	59.32	0.00	0.00	22.00	25.00
64.905	0.343	24.45	44.63	0.00	0.00	22.00	25.00
65.248	0.444	24.76	56.45	0.00	0.00	22.00	25.00
65.692	0.385	24.76	47.63	0.00	0.00	22.00	25.00
66.077	0.444	26.76	53.30	0.00	0.00	22.00	25.00
66.522	0.289	26.76	33.69	0.00	0.00	22.00	25.00
66.811	0.089	29.05	10.26	0.00	0.00	22.00	25.00
66.900	0.020	29.05	4.29	0.00	0.00	22.00	25.00
66.920	0.444	29.05	94.17	0.00	0.00	22.00	25.00
67.364	0.153	29.05	31.98	0.00	0.00	22.00	25.00
67.518	0.444	31.47	91.35	0.00	0.00	22.00	25.00
67.962	0.230	31.47	46.49	0.00	0.00	22.00	25.00
68.192	0.444	33.73	87.86	0.00	0.00	22.00	25.00
68.637	0.278	33.73	53.75	0.00	0.00	22.00	25.00
68.915	0.444	36.51	83.74	0.00	0.00	22.00	25.00
69.359	0.001	36.51	0.15	0.00	0.00	22.00	25.00
69.360	0.317	36.51	58.07	0.00	0.00	22.00	25.00
69.677	0.444	38.61	78.80	0.00	0.00	22.00	25.00
70.122	0.444	38.61	75.73	0.00	0.00	22.00	25.00
70.566	0.001	38.61	0.20	0.00	0.00	22.00	25.00
70.567	0.444	40.33	72.55	0.00	0.00	22.00	25.00
71.012	0.444	40.33	69.28	0.00	0.00	22.00	25.00
71.456	0.411	40.33	61.19	0.00	0.00	22.00	25.00
71.867	0.444	41.15	62.93	0.00	0.00	22.00	25.00
72.311	0.444	41.15	59.57	0.00	0.00	22.00	25.00
72.756	0.444	41.15	56.20	0.00	0.00	22.00	25.00
73.200	0.444	41.15	52.84	0.00	0.00	22.00	25.00
73.645	0.444	41.15	49.47	0.00	0.00	22.00	25.00
74.089	0.443	41.15	45.94	0.00	0.00	22.00	25.00

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 LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
 dx(m) : Larghezza concio  
 alpha (°) : Angolo pendenza base concio  
 W(kN/m) : Forza peso concio  
 ru(-) : Coefficiente locale pressione interstiziale  
 U(kPa) : Pressione totale dei pori base concio  
 phi' (°) : Angolo di attrito efficace base concio  
 c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate  
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TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS  
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X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
20.757	0.000	4.392	-0.237	0.0000000000E+000	0.0000000000E+000	1.2561793708E+000	0.057	5.159	3.469
21.202	0.073	4.286	-0.237	1.6360503650E+000	4.5480649379E-003	6.1071784422E+000	0.057	5.159	3.469
21.646	0.148	4.181	-0.246	5.4277691092E+000	8.8441677821E-002	1.4183223810E+001	0.057	3.689	2.436
22.090	0.213	4.068	-0.232	1.4241423664E+001	6.6189742019E-001	2.2667994801E+001	0.079	3.813	2.092
22.535	0.300	3.975	-0.182	2.5574002450E+001	1.8158861780E+000	2.8758315073E+001	0.136	4.717	2.019
22.979	0.409	3.906	-0.149	3.9800443375E+001	3.7872304067E+000	3.6403035842E+001	0.196	6.165	2.027
23.180	0.464	3.879	-0.120	4.7511509925E+001	5.0402640163E+000	4.0767230066E+001	0.224	6.689	2.043
23.581	0.580	3.833	-0.101	6.5756906782E+001	8.3927982406E+000	5.0681525162E+001	0.282	6.883	2.086
24.025	0.706	3.794	-0.087	9.0822709963E+001	1.3719361125E+001	5.4217584075E+001	0.350	5.864	2.142
24.470	0.835	3.756	-0.068	1.1394291130E+002	1.8705841216E+001	5.6787915826E+001	0.390	5.224	2.178
24.872	0.966	3.736	-0.026	1.3854559224E+002	2.4536682161E+001	6.1539195243E+001	0.430	4.481	2.218
25.317	1.100	3.734	0.013	1.6610725098E+002	3.1542502829E+001	5.9898761195E+001	0.470	3.841	2.259
25.714	1.234	3.747	0.066	1.8913280450E+002	3.7732151273E+001	5.7658733512E+001	0.500	3.411	2.288
26.158	1.373	3.790	0.105	2.1458480768E+002	4.5128489422E+001	5.3779658064E+001	0.534	3.036	2.308
26.387	1.451	3.818	0.151	2.2649476427E+002	4.8761072466E+001	5.0070605013E+001	0.549	2.884	2.313
26.832	1.573	3.892	0.173	2.4710212626E+002	5.5553384730E+001	4.2116809490E+001	0.578	2.654	2.311
27.079	1.645	3.938	0.201	2.5693752229E+002	5.9014260023E+001	3.8794383001E+001	0.593	2.556	2.304
27.523	1.748	4.031	0.216	2.7341715721E+002	6.5117046758E+001	3.5955584788E+001	0.618	2.418	2.285
27.660	1.783	4.064	0.241	2.7828329131E+002	6.7017937812E+001	3.5782436527E+001	0.626	2.382	2.277
27.679	1.789	4.069	0.270	2.7896025891E+002	6.7287331810E+001	3.5651162007E+001	0.627	2.376	2.276
28.123	1.879	4.189	0.276	2.9318003287E+002	7.3253688910E+001	2.9895540712E+001	0.648	2.283	2.242
28.347	1.928	4.253	0.308	2.9962688192E+002	7.6146788586E+001	2.9065679484E+001	0.658	2.243	2.221
28.791	2.008	4.395	0.324	3.1274487314E+002	8.2287889566E+001	2.8972633866E+001	0.680	2.170	2.175
29.076	2.064	4.490	0.336	3.2089318752E+002	8.6277085471E+001	2.8481799377E+001	0.694	2.128	2.142
29.200	2.083	4.532	0.342	3.2441999790E+002	8.8053074365E+001	2.8389339814E+001	0.700	2.110	2.127
29.644	2.151	4.684	0.344	3.3698563069E+002	9.4491325872E+001	2.7757464790E+001	0.730	2.049	2.073
29.988	2.205	4.803	0.348	3.4638382943E+002	9.9431302999E+001	2.7492554343E+001	0.752	2.004	2.030
30.432	2.272	4.959	0.355	3.5867947552E+002	1.0589734020E+002	2.8168790746E+001	0.780	1.948	1.976
30.814	2.334	5.096	0.324	3.6960237086E+002	1.1154733533E+002	2.6570892434E+001	0.803	1.900	1.931
31.259	2.371	5.227	0.289	3.8036181942E+002	1.1691668845E+002	2.3974199379E+001	0.824	1.854	1.891
31.589	2.396	5.320	0.267	3.8823438012E+002	1.2065203511E+002	2.2870507582E+001	0.838	1.823	1.865
32.034	2.411	5.433	0.256	3.9784457673E+002	1.2495849714E+002	2.1449209845E+001	0.852	1.787	1.837
32.337	2.422	5.512	0.239	4.0431967349E+002	1.2768403501E+002	1.9951928437E+001	0.861	1.766	1.821
32.782	2.419	5.612	0.229	4.1229061504E+002	1.3076283738E+002	1.7680845098E+001	0.870	1.741	1.805
33.076	2.419	5.681	0.228	4.1744973216E+002	1.3263623915E+002	1.6920461789E+001	0.874	1.727	1.796

33.521	2.410	5.781	0.229	4.2457313714E+002	1.3507622437E+002	1.5936982006E+001	0.880	1.710	1.785
33.807	2.408	5.848	0.234	4.2911243165E+002	1.3655830096E+002	1.5413537038E+001	0.884	1.701	1.779
34.251	2.397	5.951	0.238	4.3564169197E+002	1.3860556295E+002	1.4779128989E+001	0.888	1.690	1.771
34.545	2.395	6.024	0.244	4.4000682124E+002	1.3993446602E+002	1.4293760911E+001	0.891	1.685	1.766
34.990	2.383	6.131	0.259	4.4599463747E+002	1.4170671801E+002	1.4235556257E+001	0.895	1.679	1.760
35.295	2.389	6.218	0.275	4.5049837375E+002	1.4300597676E+002	1.4058005946E+001	0.898	1.677	1.755
35.739	2.385	6.338	0.273	4.5629240136E+002	1.4464603140E+002	1.2883215813E+001	0.902	1.677	1.750
36.070	2.385	6.430	0.275	4.6052097118E+002	1.4582385795E+002	1.2226680034E+001	0.904	1.679	1.746
36.515	2.379	6.551	0.272	4.6563180565E+002	1.4722178802E+002	1.1130150373E+001	0.908	1.681	1.742
36.827	2.376	6.636	0.264	4.6902018572E+002	1.4814261125E+002	1.0241532093E+001	0.910	1.681	1.741
37.271	2.361	6.750	0.263	4.7317321458E+002	1.4926763563E+002	9.0561083776E+000	0.914	1.680	1.740
37.572	2.355	6.832	0.262	4.7584021165E+002	1.5000293698E+002	8.2818787882E+000	0.916	1.678	1.740
38.016	2.335	6.945	0.272	4.7914129175E+002	1.5093005423E+002	7.3578463340E+000	0.920	1.674	1.742
38.230	2.337	7.011	0.301	4.8070644243E+002	1.5140149072E+002	6.5486702802E+000	0.922	1.671	1.745
38.311	2.336	7.034	0.290	4.8121506608E+002	1.5155837114E+002	6.1674874772E+000	0.923	1.669	1.746
38.756	2.330	7.163	0.300	4.8374652945E+002	1.5237537065E+002	5.2828119147E+000	0.926	1.659	1.752
39.053	2.332	7.256	0.310	4.8523306714E+002	1.5289934785E+002	4.5309603783E+000	0.929	1.650	1.758
39.357	2.330	7.350	0.316	4.8646219000E+002	1.5337745854E+002	3.6437755466E+000	0.931	1.639	1.570
39.789	2.334	7.489	0.321	4.8779193543E+002	1.5399869844E+002	2.5258980732E+000	0.933	1.626	1.579
40.234	2.334	7.631	0.329	4.8866459266E+002	1.5453655123E+002	1.5514055539E+000	0.934	1.615	1.589
40.529	2.340	7.732	0.339	4.8904165547E+002	1.5486266732E+002	9.2802392134E-001	0.935	1.609	1.596
40.973	2.344	7.882	0.352	4.8922023099E+002	1.5526000941E+002	1.5918417268E-002	0.937	1.603	1.607
41.273	2.358	7.994	0.373	4.8914689239E+002	1.5550828242E+002	-6.3088456934E-001	0.938	1.600	1.616
41.280	2.358	7.996	0.348	4.8914243778E+002	1.5551299027E+002	-6.4549437121E-001	0.938	1.600	1.616
41.724	2.364	8.151	0.351	4.8869558655E+002	1.5577020889E+002	-1.3054287341E+000	0.934	1.599	1.627
42.028	2.371	8.259	0.348	4.8823769778E+002	1.5592442783E+002	-1.6016345694E+000	0.932	1.599	1.635
42.472	2.374	8.411	0.345	4.8746632313E+002	1.5612432061E+002	-1.8467289242E+000	0.928	1.602	1.646
42.783	2.379	8.519	0.349	4.8686832173E+002	1.5628236920E+002	-1.94905666197E+000	0.926	1.605	1.653
43.227	2.385	8.674	0.360	4.8598645357E+002	1.5654371474E+002	-2.0902062824E+000	0.922	1.606	1.664
43.533	2.398	8.789	0.370	4.8532434845E+002	1.5679207457E+002	-2.1422439441E+000	0.921	1.607	1.671
43.840	2.407	8.901	0.378	4.8467355632E+002	1.5707862172E+002	-2.1776469913E+000	0.919	1.606	1.677
44.284	2.430	9.073	0.387	4.8366967310E+002	1.5764210393E+002	-2.1819620490E+000	0.913	1.603	1.685
44.284	2.430	9.073	0.389	4.8366943128E+002	1.5764225789E+002	-2.1819662755E+000	0.913	1.603	1.685
44.729	2.454	9.245	0.392	4.8265801550E+002	1.5840647010E+002	-2.3004175001E+000	0.908	1.598	1.691
45.030	2.473	9.364	0.394	4.8196143647E+002	1.5904332958E+002	-2.3105630792E+000	0.905	1.594	1.692
45.474	2.499	9.539	0.411	4.8093884850E+002	1.6012354430E+002	-2.4564614639E+000	0.902	1.586	1.691
45.779	2.530	9.672	0.437	4.8015695117E+002	1.6105949718E+002	-2.5649340355E+000	0.901	1.580	1.688
46.223	2.575	9.866	0.457	4.7901594535E+002	1.6256473192E+002	-2.7490907260E+000	0.900	1.570	1.678
46.526	2.621	10.014	0.496	4.7814703552E+002	1.6379447161E+002	-2.9124180559E+000	0.901	1.562	1.667
46.970	2.695	10.237	0.505	4.7682682585E+002	1.6576704448E+002	-3.0224292533E+000	0.903	1.551	1.645
47.274	2.749	10.392	0.515	4.7589879247E+002	1.6718772945E+002	-3.0968497074E+000	0.904	1.543	1.626
47.590	2.807	10.556	0.514	4.7490633604E+002	1.6870999011E+002	-3.1438417992E+000	0.906	1.535	1.605
48.016	2.881	10.773	0.503	4.7356460121E+002	1.7072010075E+002	-3.1633361564E+000	0.899	1.525	1.574
48.460	2.953	10.994	0.506	4.7215365198E+002	1.7271289034E+002	-3.3518950297E+000	0.891	1.517	1.540
48.763	3.009	11.151	0.499	4.7110009994E+002	1.7405417185E+002	-3.4365510552E+000	0.885	1.511	1.515
49.208	3.076	11.367	0.489	4.6959643102E+002	1.7575754654E+002	-3.5541414386E+000	0.876	1.504	1.482
49.510	3.125	11.517	0.476	4.6848675630E+002	1.7680742846E+002	-3.6194369190E+000	0.869	1.500	1.459
49.820	3.162	11.658	0.452	4.6738143147E+002	1.7768356638E+002	-3.6492223144E+000	0.861	1.497	1.439
50.259	3.212	11.856	0.429	4.6572689310E+002	1.7864215505E+002	-3.7348430405E+000	0.863	1.493	1.412
50.704	3.245	12.038	0.400	4.6408078966E+002	1.7922528802E+002	-3.7247206804E+000	0.864	1.491	1.390
51.004	3.260	12.154	0.372	4.6295695366E+002	1.7936496035E+002	-3.7232377793E+000	0.863	1.491	1.377
51.449	3.272	12.315	0.365	4.6131248330E+002	1.7929592347E+002	-3.8402277711E+000	0.860	1.491	1.363
51.756	3.282	12.428	0.348	4.6010384296E+002	1.7904026217E+002	-3.8647636728E+000	0.858	1.492	1.354

52.200	3.281	12.576	0.338	4.5843268836E+002	1.7841197126E+002	-3.9387195325E+000	0.852	1.494	1.346
52.507	3.284	12.682	0.330	4.5718747033E+002	1.7779126730E+002	-4.0054619032E+000	0.848	1.495	1.343
52.951	3.276	12.824	0.324	4.5544366872E+002	1.7673111129E+002	-4.1792133788E+000	0.841	1.498	1.341
53.263	3.275	12.927	0.331	4.5408430621E+002	1.7578819870E+002	-4.4301933934E+000	0.835	1.501	1.342
53.707	3.272	13.074	0.340	4.5207007786E+002	1.7432087966E+002	-4.9251965272E+000	0.826	1.505	1.346
54.020	3.278	13.184	0.336	4.5044493070E+002	1.7311678874E+002	-5.1595139369E+000	0.819	1.507	1.350
54.464	3.269	13.329	0.329	4.4817849117E+002	1.7142614963E+002	-5.4239025239E+000	0.810	1.511	1.357
54.764	3.266	13.429	0.318	4.4648992101E+002	1.7018002663E+002	-5.6150029754E+000	0.803	1.514	1.364
55.208	3.246	13.566	0.312	4.4401247486E+002	1.6837968196E+002	-5.9487953276E+000	0.793	1.518	1.374
55.502	3.235	13.659	0.302	4.4219094374E+002	1.6707800901E+002	-6.1628875357E+000	0.786	1.520	1.382
55.946	3.204	13.788	0.295	4.3947455376E+002	1.6517478445E+002	-6.5280195530E+000	0.777	1.524	1.394
56.236	3.186	13.876	0.291	4.3750205640E+002	1.6381197545E+002	-6.4952112332E+000	0.770	1.526	1.403
56.390	3.171	13.917	0.296	4.3652926256E+002	1.6314570869E+002	-6.6854434172E+000	0.766	1.527	1.407
56.834	3.142	14.052	0.310	4.3310696704E+002	1.6083981330E+002	-8.3918362120E+000	0.757	1.532	1.422
56.977	3.135	14.099	0.312	4.3187731491E+002	1.6001819594E+002	-8.5817197282E+000	0.753	1.534	1.427
57.422	3.104	14.236	0.315	4.2810797963E+002	1.5751808114E+002	-8.9431906905E+000	0.743	1.543	1.443
57.713	3.088	14.331	0.317	4.2540923313E+002	1.5573291967E+002	-9.1681146202E+000	0.735	1.550	1.455
58.158	3.054	14.469	0.318	4.2138777838E+002	1.5308303722E+002	-9.4391160204E+000	0.724	1.563	1.472
58.455	3.037	14.567	0.321	4.1850305928E+002	1.5117740106E+002	-9.5615183774E+000	0.717	1.573	1.484
58.900	3.001	14.707	0.323	4.1434593838E+002	1.4842863038E+002	-9.6576990057E+000	0.705	1.590	1.502
59.206	2.982	14.809	0.325	4.1132485631E+002	1.4641218234E+002	-9.6411082765E+000	0.697	1.605	1.515
59.650	2.944	14.951	0.314	4.0718580733E+002	1.4362966374E+002	-8.8641318258E+000	0.686	1.628	1.533
59.855	2.923	15.013	0.307	4.0540996887E+002	1.4241211261E+002	-8.7129941295E+000	0.681	1.640	1.778
59.974	2.912	15.050	0.306	4.0436931731E+002	1.4169039823E+002	-8.6540013424E+000	0.679	1.647	1.784
60.419	2.865	15.186	0.312	4.0067614871E+002	1.3908180580E+002	-8.4772960168E+000	0.672	1.670	1.806
60.727	2.838	15.286	0.320	3.9802520788E+002	1.3717218796E+002	-8.4689897141E+000	0.668	1.687	1.823
61.172	2.794	15.427	0.341	3.9434104713E+002	1.3448968744E+002	-9.0900197691E+000	0.661	1.710	1.847
61.471	2.780	15.539	0.364	3.9145357156E+002	1.3241484715E+002	-9.4217360153E+000	0.655	1.726	1.866
61.916	2.750	15.698	0.363	3.8740355469E+002	1.2954339414E+002	-9.3587412158E+000	0.648	1.746	1.891
62.211	2.734	15.808	0.364	3.8459306474E+002	1.2763716528E+002	-9.3886142144E+000	0.643	1.758	1.906
62.655	2.702	15.967	0.363	3.8050978836E+002	1.2501608471E+002	-9.3949143458E+000	0.636	1.770	1.925
62.953	2.683	16.077	0.349	3.7767598560E+002	1.2334933742E+002	-9.2510286219E+000	0.633	1.775	1.933
63.397	2.636	16.227	0.341	3.7375222934E+002	1.2136608430E+002	-9.1239021916E+000	0.629	1.772	1.936
63.700	2.609	16.332	0.365	3.7092476300E+002	1.2028166327E+002	-9.7185416531E+000	0.629	1.762	1.928
64.145	2.577	16.499	0.380	3.6634951693E+002	1.1923120595E+002	-1.1001715575E+001	0.631	1.726	1.891
64.370	2.563	16.587	0.387	3.6378855101E+002	1.1888343922E+002	-1.1578994261E+001	0.633	1.702	1.865
64.461	2.558	16.622	0.369	3.6273167646E+002	1.1878863635E+002	-1.1657478383E+001	0.636	1.692	1.853
64.905	2.518	16.784	0.373	3.5757228234E+002	1.1862027561E+002	-1.2853381827E+001	0.648	1.637	1.793
65.248	2.494	16.916	0.373	3.5284029676E+002	1.1863661717E+002	-1.4189150123E+001	0.660	1.589	1.741
65.692	2.451	17.078	0.366	3.4631741616E+002	1.1877920423E+002	-1.5945708977E+001	0.677	1.529	1.674
66.077	2.415	17.220	0.378	3.3974801612E+002	1.1879491689E+002	-1.9452694304E+001	0.693	1.477	1.618
66.522	2.363	17.392	0.381	3.2986992772E+002	1.1816494012E+002	-2.3150466613E+001	0.711	1.421	1.558
66.811	2.325	17.499	0.369	3.2300834516E+002	1.1750623845E+002	-2.4549782544E+001	0.723	1.389	1.525
66.900	2.307	17.531	0.366	3.2079298324E+002	1.1724748625E+002	-2.7588077505E+001	0.727	1.380	1.516
66.920	2.304	17.539	0.371	3.2022872624E+002	1.1716683510E+002	-2.8252742820E+001	0.727	1.378	1.513
67.364	2.221	17.703	0.380	3.0727999652E+002	1.1506032642E+002	-3.4211796647E+001	0.744	1.340	1.475
67.518	2.199	17.766	0.386	3.0177368400E+002	1.1382944287E+002	-3.5993479294E+001	0.748	1.330	1.465
67.962	2.095	17.934	0.375	2.8573554663E+002	1.0968716590E+002	-3.6828282209E+001	0.759	1.309	1.446
68.192	2.039	18.019	0.372	2.7716080635E+002	1.0721541756E+002	-3.8158454292E+001	0.762	1.302	1.440
68.637	1.908	18.185	0.379	2.5939170815E+002	1.0133746843E+002	-4.1940520262E+001	0.766	1.298	1.440
68.915	1.831	18.293	0.390	2.4738623436E+002	9.6949616980E+001	-4.3623529732E+001	0.764	1.303	1.447
69.359	1.675	18.466	0.389	2.2767436401E+002	8.9136703973E+001	-4.2661886937E+001	0.758	1.322	1.469
69.360	1.675	18.467	0.402	2.2764056537E+002	8.9122485279E+001	-4.2668094016E+001	0.758	1.322	1.470

69.677	1.567	18.594	0.423	2.1293406875E+002	8.2736857308E+001	-4.8002161476E+001	0.747	1.349	1.498
70.122	1.407	18.789	0.419	1.9058330106E+002	7.2533765983E+001	-4.7454229454E+001	0.723	1.406	1.557
70.566	1.230	18.967	0.400	1.7075901145E+002	6.2636344358E+001	-4.6841142539E+001	0.693	1.489	1.641
70.567	1.230	18.967	0.413	1.7070212901E+002	6.2607925414E+001	-4.6837663305E+001	0.693	1.489	1.642
71.012	1.036	19.151	0.430	1.5144522187E+002	5.2780541845E+001	-4.4613585240E+001	0.657	1.602	1.752
71.456	0.857	19.349	0.482	1.3105170090E+002	4.2179382170E+001	-4.9571403170E+001	0.602	1.777	1.919
71.867	0.722	19.563	0.533	1.0926934047E+002	3.0348188108E+001	-5.1495313462E+001	0.508	2.050	2.175
72.311	0.576	19.805	0.565	8.7096912761E+001	1.8598504061E+001	-4.8550151390E+001	0.380	2.520	2.623
72.756	0.448	20.066	0.580	6.6120279993E+001	8.5870489252E+000	-4.3442526447E+001	0.224	3.138	3.250
73.200	0.314	20.321	0.595	4.8487265883E+001	2.8128440941E+000	-3.9055490897E+001	0.099	3.888	4.137
73.645	0.199	20.594	0.631	3.1409621210E+001	6.4734495754E-001	-3.7926312400E+001	0.057	4.151	4.520
74.089	0.098	20.881	0.631	1.4780167127E+001	1.2501819801E-001	-3.5399534311E+001	0.057	1.700	1.790

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 LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
 ht(m) : Altezza linea di thrust da nodo sinistro base concio  
 yt(m) : coordinata Y linea di trust  
 yt'(-) : gradiente pendenza locale linea di trust  
 E(x) (kN/m) : Forza Normale interconcio  
 T(x) (kN/m) : Forza Tangenziale interconcio  
 E' (kN) : derivata Forza normale interconcio  
 Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)  
 FS\_qFEM(x) (-) : fattore di sicurezza locale stimato (locale in X) by qFEM  
 FS\_srmFEM(x) (-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure

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TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

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X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
20.757	0.444	0.479	-21.958	-1.008	-0.483	8.455	4.051
21.202	0.444	0.479	-21.958	-3.024	-1.449	11.537	5.528
21.646	0.444	0.479	-21.958	-5.040	-2.415	15.625	7.486
22.090	0.444	0.479	-21.958	-7.057	-3.381	19.937	9.552
22.535	0.444	0.479	-21.958	-9.073	-4.347	24.829	11.897
22.979	0.201	0.217	-21.958	-10.536	-2.282	28.890	6.257
23.180	0.401	0.432	-21.958	-12.220	-5.281	33.618	14.530
23.581	0.444	0.474	-20.506	-13.967	-6.627	41.366	19.626
24.025	0.444	0.474	-20.506	-16.457	-7.808	44.392	21.061
24.470	0.403	0.430	-20.506	-18.830	-8.095	51.537	22.156
24.872	0.444	0.465	-17.020	-18.003	-8.366	56.831	26.411
25.317	0.397	0.415	-17.020	-19.853	-8.243	60.146	24.971
25.714	0.444	0.455	-12.249	-15.996	-7.274	64.623	29.386
26.158	0.229	0.234	-12.249	-16.969	-3.979	66.494	15.591
26.387	0.444	0.447	-6.115	-9.114	-4.073	67.613	30.217
26.832	0.247	0.249	-6.115	-9.544	-2.375	68.954	17.160
27.079	0.444	0.444	-1.201	-1.965	-0.873	69.542	30.910
27.523	0.137	0.137	-1.201	-2.026	-0.277	71.330	9.750
27.660	0.019	0.019	-1.201	-2.046	-0.039	72.087	1.363
27.679	0.444	0.445	3.843	6.942	3.092	72.852	32.447

28.123	0.224	0.224	3.843	7.535	1.688	77.730	17.417
28.347	0.444	0.449	7.873	16.454	7.381	80.313	36.029
28.791	0.285	0.287	7.873	17.698	5.086	85.572	24.593
29.076	0.124	0.126	10.698	24.717	3.121	86.047	10.867
29.200	0.444	0.452	10.698	25.030	11.320	87.047	39.366
29.644	0.344	0.350	10.698	25.101	8.776	87.236	30.500
29.988	0.444	0.453	11.224	26.338	11.932	86.956	39.395
30.432	0.382	0.389	11.224	26.401	10.280	87.193	33.952
30.814	0.444	0.454	11.829	27.800	12.622	86.167	39.121
31.259	0.331	0.338	11.829	27.844	9.411	86.124	29.110
31.589	0.444	0.455	12.464	29.281	13.326	85.324	38.831
32.034	0.304	0.311	12.464	29.308	9.112	85.258	26.509
32.337	0.444	0.456	13.126	30.774	14.042	84.365	38.496
32.782	0.295	0.303	13.126	30.782	9.313	84.288	25.500
33.076	0.444	0.457	13.742	32.113	14.691	83.638	38.262
33.521	0.286	0.294	13.742	32.102	9.449	83.566	24.596
33.807	0.444	0.459	14.355	33.391	15.316	82.934	38.041
34.251	0.294	0.304	14.355	33.359	10.131	82.850	25.162
34.545	0.444	0.460	14.947	34.566	15.898	82.205	37.809
34.990	0.305	0.316	14.947	34.512	10.901	82.118	25.938
35.295	0.444	0.461	15.507	35.611	16.423	81.453	37.563
35.739	0.331	0.344	15.507	35.532	12.213	81.276	27.936
36.070	0.444	0.462	15.869	36.188	16.718	80.761	37.310
36.515	0.312	0.324	15.869	36.096	11.698	80.558	26.106
36.827	0.444	0.463	16.244	36.753	17.011	80.015	37.035
37.271	0.301	0.314	16.244	36.647	11.490	79.797	25.019
37.572	0.444	0.464	16.624	37.290	17.294	79.235	36.746
38.016	0.214	0.223	16.624	37.181	8.292	79.031	17.626
38.230	0.081	0.085	16.624	37.164	3.154	78.982	6.704
38.311	0.444	0.465	17.005	38.032	17.673	78.888	36.659
38.756	0.297	0.311	17.005	38.194	11.860	79.190	24.589
39.053	0.304	0.318	17.380	39.060	12.438	79.107	25.191
39.357	0.433	0.453	17.380	39.180	17.764	67.989	30.825
39.789	0.444	0.467	17.755	40.026	18.676	67.903	31.684
40.234	0.295	0.310	17.755	40.112	12.431	68.040	21.087
40.529	0.444	0.468	18.122	40.907	19.127	67.904	31.750
40.973	0.300	0.316	18.122	40.978	12.931	68.015	21.462
41.273	0.007	0.007	18.480	41.702	0.306	67.809	0.498
41.280	0.444	0.469	18.480	41.686	19.531	67.793	31.763
41.724	0.303	0.320	18.480	41.657	13.318	67.757	21.663
42.028	0.444	0.469	18.484	41.638	19.509	67.716	31.728
42.472	0.311	0.328	18.484	41.608	13.634	67.669	22.173
42.783	0.444	0.469	18.489	41.588	19.487	67.617	31.683
43.227	0.306	0.323	18.489	41.559	13.414	67.558	21.805
43.533	0.307	0.323	18.493	41.544	13.438	67.510	21.838
43.840	0.444	0.469	18.493	41.747	19.561	67.780	31.760
44.284	0.000	0.000	18.493	41.961	0.005	68.084	0.008
44.284	0.444	0.469	18.498	42.185	19.767	68.368	32.036
44.729	0.301	0.317	18.498	42.544	13.488	68.861	21.831
45.030	0.444	0.469	18.502	42.913	20.109	69.357	32.501
45.474	0.305	0.322	18.502	43.274	13.921	69.835	22.465
45.779	0.444	0.469	18.507	43.645	20.452	70.334	32.959
46.223	0.302	0.319	18.507	44.005	14.037	70.806	22.586



46.526	0.444	0.469	18.512	44.374	20.795	71.298	33.412
46.970	0.304	0.320	18.512	44.734	14.318	71.804	22.983
47.274	0.316	0.334	18.516	45.043	15.025	72.225	24.092
47.590	0.426	0.449	18.516	45.854	20.584	73.414	32.956
48.016	0.444	0.469	18.525	47.221	22.131	75.387	35.331
48.460	0.303	0.320	18.525	48.380	15.480	77.078	24.663
48.763	0.444	0.469	18.534	49.558	23.227	78.801	36.933
49.208	0.302	0.319	18.534	50.715	16.173	80.512	25.675
49.510	0.310	0.327	18.543	51.684	16.890	81.933	26.775
49.820	0.439	0.464	18.543	52.079	24.139	82.558	38.266
50.259	0.444	0.469	18.551	51.930	24.341	82.370	38.609
50.704	0.301	0.317	18.551	51.786	16.421	82.227	26.073
51.004	0.444	0.469	18.560	51.663	24.217	82.059	38.466
51.449	0.307	0.324	18.560	51.518	16.685	81.901	26.525
51.756	0.444	0.469	18.569	51.393	24.092	81.727	38.312
52.200	0.307	0.323	18.569	51.247	16.575	81.564	26.380
52.507	0.444	0.469	18.578	51.122	23.966	81.373	38.148
52.951	0.312	0.329	18.578	50.974	16.773	81.209	26.722
53.263	0.444	0.469	18.586	50.847	23.839	81.010	37.980
53.707	0.312	0.330	18.586	50.699	16.713	80.839	26.649
54.020	0.444	0.470	19.010	51.520	24.215	80.282	37.733
54.464	0.299	0.317	19.010	51.352	16.256	80.076	25.349
54.764	0.444	0.471	19.444	52.156	24.579	79.479	37.455
55.208	0.294	0.312	19.444	51.964	16.201	79.253	24.708
55.502	0.444	0.473	19.883	52.737	24.921	78.618	37.151
55.946	0.290	0.309	19.883	52.521	16.203	78.375	24.179
56.236	0.154	0.164	20.319	53.337	8.735	77.813	12.743
56.390	0.444	0.474	20.319	53.064	25.145	77.562	36.754
56.834	0.143	0.152	20.319	52.770	8.033	77.248	11.759
56.977	0.444	0.475	20.754	53.386	25.370	76.503	36.355
57.422	0.292	0.312	20.754	52.989	16.540	76.060	23.741
57.713	0.444	0.477	21.187	53.468	25.483	75.191	35.835
58.158	0.297	0.319	21.187	53.038	16.917	74.717	23.832
58.455	0.444	0.478	21.609	53.436	25.541	73.815	35.281
58.900	0.306	0.329	21.609	52.969	17.445	73.307	24.143
59.206	0.444	0.479	22.013	53.273	25.535	72.368	34.688
59.650	0.205	0.221	22.013	52.844	11.693	71.793	15.886
59.855	0.119	0.128	22.013	52.646	6.757	79.114	10.154
59.974	0.444	0.480	22.351	52.978	25.455	78.563	37.748
60.419	0.309	0.334	22.351	52.564	17.534	78.238	26.098
60.727	0.444	0.482	22.699	52.773	25.420	77.578	37.368
61.172	0.300	0.325	22.699	52.340	17.012	77.394	25.156
61.471	0.444	0.483	23.050	52.520	25.364	76.644	37.014
61.916	0.295	0.321	23.050	52.066	16.702	76.211	24.448
62.211	0.444	0.484	23.401	52.205	25.278	75.412	36.515
62.655	0.297	0.324	23.401	51.725	16.754	74.881	24.255
62.953	0.444	0.486	23.761	51.833	25.167	73.876	35.869
63.397	0.303	0.331	23.761	51.323	17.004	73.149	24.235
63.700	0.444	0.487	24.111	51.365	25.007	72.084	35.094
64.145	0.225	0.247	24.111	50.886	12.568	71.404	17.636
64.370	0.091	0.099	24.111	50.589	5.021	70.986	7.045
64.461	0.444	0.488	24.449	50.297	24.552	69.814	34.080
64.905	0.343	0.376	24.449	49.085	18.473	68.605	25.820

65.248	0.444	0.489	24.761	48.314	23.643	67.219	32.895
65.692	0.385	0.424	24.761	47.003	19.950	66.160	28.081
66.077	0.444	0.498	26.762	48.227	24.002	64.157	31.930
66.522	0.289	0.324	26.762	46.879	15.169	63.393	20.512
66.811	0.089	0.102	29.053	48.745	4.982	61.663	6.302
66.900	0.020	0.023	29.053	90.961	2.081	92.842	2.124
66.920	0.444	0.508	29.053	89.956	45.728	92.407	46.974
67.364	0.153	0.175	29.053	88.664	15.531	92.846	16.263
67.518	0.444	0.521	31.471	91.535	47.691	89.785	46.779
67.962	0.230	0.270	31.471	89.838	24.273	89.322	24.133
68.192	0.444	0.534	33.727	91.297	48.780	87.014	46.492
68.637	0.278	0.334	33.727	89.232	29.842	87.067	29.117
68.915	0.444	0.553	36.507	90.113	49.819	83.996	46.437
69.359	0.001	0.001	36.507	88.645	0.087	83.397	0.082
69.360	0.317	0.395	36.507	87.548	34.549	84.017	33.155
69.677	0.444	0.569	38.612	86.472	49.176	82.251	46.776
70.122	0.444	0.569	38.612	83.097	47.257	80.139	45.575
70.566	0.001	0.002	38.612	81.405	0.126	79.949	0.124
70.567	0.444	0.583	40.335	80.547	46.956	76.816	44.781
71.012	0.444	0.583	40.335	76.917	44.840	76.151	44.393
71.456	0.411	0.539	40.335	73.423	39.605	77.488	41.798
71.867	0.444	0.590	41.152	70.174	41.414	73.816	43.564
72.311	0.444	0.590	41.152	66.422	39.200	69.659	41.110
72.756	0.444	0.590	41.152	62.669	36.985	62.019	36.601
73.200	0.444	0.590	41.152	58.917	34.771	55.255	32.610
73.645	0.444	0.590	41.152	55.164	32.556	51.230	30.234
74.089	0.443	0.588	41.152	51.419	30.233	48.946	28.779

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LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
dx(m) : Larghezza concio  
dl(m) : lunghezza base concio  
alpha(°) : Angolo pendenza base concio  
TauStress(kPa) : Sforzo di taglio su base concio  
TauF (kN/m) : Forza di taglio su base concio  
TauStrength(kPa) : Resistenza al taglio su base concio  
TauS (kN/m) : Forza resistente al taglio su base concio

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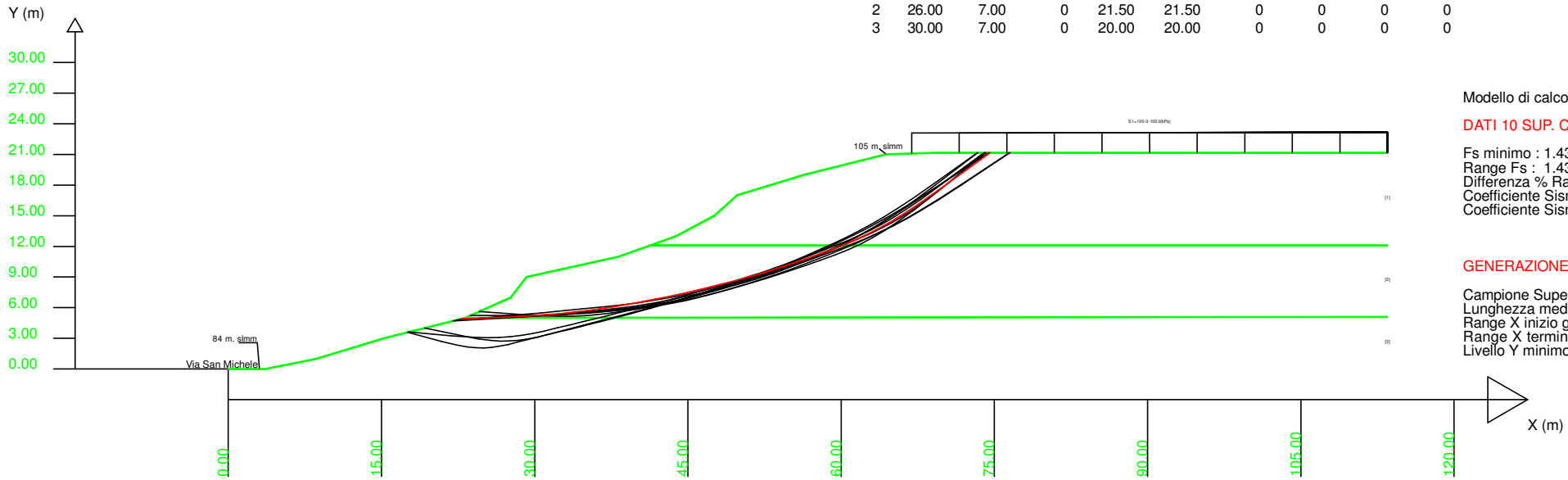
SSAP 5.0 (2020) - Slope Stability Analysis Program  
 Software by Dr.Geol. L.Borselli - www.lorenzo-borselli.eu  
 SSAP/DXF generator rel. 2.0 (2020)

Data : 10/11/2020  
 Localita' : San Sebastiano - S.Maria a Monte  
 Descrizione : Verifica di stabilitA del pendio stato attuale in condizioni sismiche drenate  
 [n] = N. strato o lente

Sn --> Sovraccarico

# Parametri Geotecnici degli strati #

N.	phi'	C'	Cu	Gamm	GammSat	sgci	GSI	mi	D
..	deg	kPa	kPa	kN/m3	kN/m3	MPa	..	..	..
1	22.00	25.00	0	19.50	20.00	0	0	0	0
2	26.00	7.00	0	21.50	21.50	0	0	0	0
3	30.00	7.00	0	20.00	20.00	0	0	0	0



Modello di calcolo : Morgenstern - Price (1965)

DATI 10 SUP. CON MINOR Fs

Fs minimo : 1.4336  
 Range Fs : 1.4336 - 1.4409  
 Differenza % Range Fs : 0.51  
 Coefficiente Sismico orizzontale - Kh: 0.0610  
 Coefficiente Sismico verticale - Kv: 0.0305

GENERAZIONE SUPERFICI RANDOM

Campione Superfici - N.: 10000  
 Lunghezza media segmenti (m) : 4.5  
 Range X inizio generazione : 2.3 - 25.7  
 Range X termine generazione : 54.0 - 111.2  
 Livello Y minimo considerato : 0.0

# Report elaborazioni #

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SSAP 5.0 - Slope Stability Analysis Program (1991,2020)

WWW.SSAP.EU

Build No. 11716

BY

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\*\* Gia' Ricercatore CNR-IRPI fino a Luglio 2011

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Ultima Revisione struttura tabelle del report: 12 settembre 2020  
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File report: D:\ssp2010prove\lavori\smontemuro\versante\verifiche\attuale sismico.txt

Data: 10/11/2020

Localita' : San Sebastiano - S.Maria a Monte

Descrizione: Verifica di stabilit  del pendio stato attuale in condizioni sismiche drenate

Modello pendio: ATTUALE.mod

----- PARAMETRI DEL MODELLO DEL PENDIO -----

\_\_\_ PARAMETRI GEOMETRICI - Coordinate X Y (in m) \_\_\_

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	0.00	41.28	12.09	23.18	5.00	-	-
3.60	0.00	113.48	12.09	113.48	5.11	-	-
8.62	1.00	-	-	-	-	-	-
15.21	3.00	-	-	-	-	-	-
23.18	5.00	-	-	-	-	-	-
27.66	7.00	-	-	-	-	-	-
29.20	9.00	-	-	-	-	-	-
38.23	11.00	-	-	-	-	-	-
41.28	12.09	-	-	-	-	-	-
43.84	13.00	-	-	-	-	-	-
47.59	15.00	-	-	-	-	-	-
49.82	17.00	-	-	-	-	-	-
56.39	19.00	-	-	-	-	-	-
64.37	21.00	-	-	-	-	-	-
66.92	21.09	-	-	-	-	-	-
69.36	21.17	-	-	-	-	-	-
94.25	21.17	-	-	-	-	-	-
113.48	21.17	-	-	-	-	-	-

## ASSENZA DI FALDA ##

----- PARAMETRI GEOMECCANICI -----

fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
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STRATO 1	22.00	25.00	0.00	19.50	20.00	2.277	0.00	0.00	0.00	0.00
STRATO 2	26.00	7.00	0.00	21.50	21.50	1.718	0.00	0.00	0.00	0.00
STRATO 3	30.00	7.00	0.00	20.00	20.00	2.091	0.00	0.00	0.00	0.00

LEGENDA: fi` \_\_\_\_\_ Angolo di attrito interno efficace(in gradi)  
 C` \_\_\_\_\_ Coesione efficace (in Kpa)  
 Cu \_\_\_\_\_ Resistenza al taglio Non drenata (in Kpa)  
 Gamm \_\_\_\_\_ Peso di volume terreno fuori falda (in KN/m^3)  
 Gamm\_sat \_\_\_\_\_ Peso di volume terreno immerso (in KN/m^3)  
 STR\_IDX \_\_\_\_\_ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)  
 ---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)-  
 sigci \_\_\_\_\_ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)  
 GSI \_\_\_\_\_ Geological Strenght Index ammasso(adimensionale)  
 mi \_\_\_\_\_ Indice litologico ammasso(adimensionale)  
 D \_\_\_\_\_ Fattore di disturbo ammasso(adimensionale)  
 Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)

Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

----- SOVRACCARICHI PRESENTI -----

SOVRACCARICO N.1

Carico in X1 (Kpa): 100.00  
 Carico in X2 (Kpa): 100.00  
 Posizione carico da X1 m.: 66.9000  
 a X2 m.: 113.4800  
 Inclinazione carico (gradi): 90.00  
 Componenti distribuzione forza unitaria applicata:  
 #Orizzontale (per metro di proiezione Verticale) (kN/m): da 0.00 a 0.00  
 #Verticale (per metro di proiezione Orizzontale) (kN/m): da 100.00 a 100.00  
 ##Nota: la distribuzione del carico e delle forze unitarie puo' variare  
 in modo lineare tra gli estremi di coordinate X1 e X2

----- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM -----

\*\*\* PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI  
 METODO DI RICERCA: CONVEX RANDOM - Chen (1992)  
 FILTRAGGIO SUPERFICI : ATTIVATO  
 COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00  
 LUNGHEZZA MEDIA SEGMENTI (m): 4.5 (+/-) 50%  
 INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 2.27 25.70  
 LIVELLO MINIMO CONSIDERATO (Ymin): 0.00  
 INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 54.00 111.21

\*\*\* TOTALE SUPERFICI GENERATE : 10000

----- INFORMAZIONI PARAMETRI DI CALCOLO -----

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)  
 METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : A (rapido)  
 COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0610  
 COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0305  
 COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000  
 FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00

FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante le tutte le verifiche globali.

I valori >0 impostati dall'utente sono utilizzati solo in caso di verifica singola

----- RISULTATO FINALE ELABORAZIONI -----

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\* DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*

Fattore di sicurezza (FS)	1.4336	- Min. -	X	Y	Lambda=	0.5016
			22.78	4.90		
			27.26	5.09		
			29.52	5.20		
			31.10	5.31		
			32.50	5.42		
			33.78	5.56		
			35.03	5.71		
			36.31	5.88		
			37.61	6.08		
			38.99	6.31		
			40.30	6.54		
			41.59	6.79		
			42.86	7.04		
			44.14	7.31		
			45.41	7.60		
			46.70	7.90		
			48.01	8.22		
			49.39	8.58		
			50.69	8.93		
			51.97	9.30		
			53.23	9.68		
			54.50	10.09		
			55.77	10.51		
			57.07	10.96		
			58.42	11.46		
			59.88	12.01		
			61.17	12.54		
			62.41	13.11		
			63.60	13.71		
			64.85	14.40		
			66.18	15.22		
			67.73	16.24		
			69.98	17.83		
			74.59	21.17		

Fattore di sicurezza (FS)	1.4351	- N.2 --	X	Y	Lambda=	0.5050
			22.42	4.81		
			26.77	5.02		
			28.99	5.15		
			30.57	5.24		

31.98	5.34
33.24	5.45
34.50	5.56
35.78	5.69
37.09	5.82
38.45	5.98
39.72	6.15
40.96	6.34
42.18	6.55
43.43	6.79
44.65	7.05
45.90	7.35
47.18	7.68
48.57	8.06
49.87	8.44
51.13	8.83
52.37	9.23
53.62	9.65
54.87	10.10
56.14	10.58
57.47	11.10
58.91	11.69
60.18	12.25
61.40	12.85
62.56	13.47
63.80	14.19
65.11	15.04
66.63	16.09
68.85	17.73
73.38	21.17

Fattore di sicurezza (FS)	1.4357	- N.3	--	X	Y	Lambda=	0.5078
				22.73	4.89		
				27.34	5.06		
				29.69	5.16		
				31.35	5.25		
				32.83	5.34		
				34.16	5.45		
				35.48	5.56		
				36.83	5.69		
				38.22	5.84		
				39.67	6.02		
				41.02	6.20		
				42.32	6.42		
				43.59	6.66		
				44.91	6.94		
				46.18	7.25		
				47.48	7.59		
				48.82	7.99		
				50.27	8.44		
				51.65	8.88		
				53.01	9.33		

54.34	9.78
55.67	10.24
57.01	10.72
58.37	11.21
59.76	11.73
61.23	12.29
62.57	12.84
63.86	13.42
65.11	14.03
66.42	14.71
67.82	15.52
69.44	16.51
71.78	18.02
76.52	21.17

Fattore di sicurezza (FS)    1.4375   - N.4 --    X    Y    Lambda= 0.4869

19.24	4.01
22.86	3.26
24.55	2.94
25.68	2.79
26.62	2.73
27.54	2.75
28.38	2.81
29.28	2.94
30.23	3.12
31.36	3.39
32.43	3.64
33.44	3.89
34.44	4.14
35.41	4.38
36.39	4.63
37.37	4.88
38.36	5.14
39.36	5.40
40.34	5.67
41.32	5.94
42.28	6.21
43.26	6.50
44.23	6.78
45.20	7.08
46.18	7.38
47.17	7.69
48.16	8.01
49.14	8.32
50.13	8.63
51.11	8.94
52.09	9.26
53.09	9.57
54.09	9.89
55.10	10.21
56.07	10.54
57.03	10.88



57.98	11.22
58.94	11.59
59.90	11.98
60.89	12.39
61.91	12.84
63.01	13.33
63.99	13.81
64.93	14.31
65.83	14.83
66.78	15.43
67.79	16.13
68.96	17.00
70.67	18.35
74.15	21.17

Fattore di sicurezza (FS)    1.4397   - N.5   --    X            Y            Lambda=   0.4991

24.57	5.62
28.88	5.32
31.00	5.20
32.46	5.16
33.73	5.17
34.92	5.23
36.05	5.31
37.24	5.44
38.47	5.61
39.85	5.84
41.11	6.07
42.31	6.31
43.48	6.58
44.68	6.88
45.84	7.20
47.03	7.55
48.26	7.95
49.58	8.39
50.83	8.84
52.04	9.28
53.23	9.74
54.44	10.21
55.63	10.71
56.85	11.22
58.11	11.78
59.44	12.38
60.66	12.96
61.85	13.57
63.00	14.20
64.19	14.89
65.48	15.69
66.95	16.67
69.08	18.14
73.35	21.17

Fattore di sicurezza (FS)	1.4398	- N.6 --	X	Y	Lambda= 0.4971
			23.69	5.23	
			28.25	5.25	
			30.55	5.27	
			32.17	5.31	
			33.60	5.38	
			34.90	5.46	
			36.18	5.56	
			37.49	5.68	
			38.84	5.82	
			40.28	6.00	
			41.61	6.19	
			42.90	6.40	
			44.16	6.63	
			45.45	6.90	
			46.71	7.20	
			48.00	7.53	
			49.33	7.90	
			50.76	8.33	
			52.11	8.76	
			53.42	9.19	
			54.71	9.63	
			56.01	10.10	
			57.30	10.59	
			58.61	11.11	
			59.97	11.67	
			61.41	12.28	
			62.74	12.88	
			64.02	13.50	
			65.27	14.14	
			66.56	14.84	
			67.96	15.65	
			69.56	16.64	
			71.86	18.12	
			76.47	21.17	

Fattore di sicurezza (FS)	1.4399	- N.7 --	X	Y	Lambda= 0.5126
			17.56	3.59	
			20.86	2.71	
			22.38	2.34	
			23.39	2.16	
			24.21	2.08	
			25.03	2.07	
			25.76	2.12	
			26.56	2.23	
			27.41	2.41	
			28.45	2.67	
			29.42	2.91	
			30.34	3.15	
			31.25	3.38	
			32.13	3.60	
			33.01	3.83	

33.89	4.06
34.78	4.29
35.66	4.52
36.54	4.75
37.43	4.98
38.31	5.21
39.20	5.44
40.08	5.68
40.97	5.91
41.85	6.14
42.73	6.37
43.62	6.60
44.50	6.84
45.38	7.07
46.26	7.30
47.15	7.54
48.04	7.78
48.95	8.03
49.86	8.27
50.74	8.53
51.60	8.79
52.45	9.06
53.32	9.36
54.18	9.66
55.06	9.99
55.96	10.34
56.91	10.73
57.81	11.11
58.67	11.51
59.52	11.91
60.39	12.34
61.23	12.78
62.10	13.26
62.99	13.77
63.93	14.33
64.83	14.88
65.72	15.42
66.58	15.98
67.46	16.55
68.43	17.20
69.52	17.94
71.06	19.03
74.09	21.17

Fattore di sicurezza (FS)	1.4403	- N.8	--	X	Y	Lambda=	0.4836
				22.01	4.71		
				26.41	4.96		
				28.70	5.09		
				30.32	5.19		
				31.79	5.29		
				33.08	5.37		
				34.40	5.46		

35.72	5.56
37.07	5.65
38.46	5.76
39.74	5.88
41.00	6.04
42.22	6.22
43.50	6.44
44.72	6.69
45.99	6.98
47.29	7.31
48.70	7.70
50.05	8.08
51.36	8.46
52.64	8.86
53.93	9.27
55.22	9.70
56.55	10.15
57.93	10.63
59.41	11.17
60.70	11.69
61.92	12.26
63.08	12.86
64.33	13.60
65.64	14.47
67.18	15.59
69.44	17.37
74.13	21.17

Fattore di sicurezza (FS)    1.4408    - N.9 --    X    Y    Lambda= 0.4983

17.67	3.62
21.90	3.25
23.93	3.11
25.32	3.07
26.49	3.09
27.62	3.17
28.67	3.30
29.77	3.48
30.92	3.71
32.22	4.02
33.46	4.32
34.67	4.62
35.86	4.91
37.03	5.20
38.20	5.49
39.38	5.79
40.56	6.09
41.75	6.39
42.93	6.70
44.09	7.01
45.25	7.34
46.41	7.67
47.57	8.01

48.74	8.36
49.93	8.72
51.14	9.10
52.32	9.49
53.48	9.88
54.63	10.28
55.79	10.69
56.95	11.12
58.14	11.58
59.36	12.06
60.66	12.58
61.83	13.09
62.95	13.63
64.02	14.20
65.16	14.86
66.37	15.62
67.78	16.58
69.82	18.06
73.98	21.17

Fattore di sicurezza (FS)    1.4409   - N.10   --    X            Y            Lambda= 0.5061

22.18	4.75
26.60	5.13
28.89	5.33
30.52	5.48
31.99	5.62
33.29	5.74
34.60	5.87
35.93	6.01
37.27	6.15
38.65	6.30
39.94	6.46
41.22	6.64
42.46	6.85
43.74	7.09
44.99	7.36
46.28	7.65
47.61	7.99
49.06	8.38
50.38	8.76
51.67	9.16
52.92	9.59
54.20	10.05
55.45	10.53
56.74	11.06
58.07	11.63
59.51	12.29
60.84	12.92
62.12	13.56
63.38	14.22
64.66	14.94
66.06	15.76

67.65 16.74  
69.93 18.20  
74.48 21.17

----- ANALISI DEFICIT DI RESISTENZA -----

# DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*

# Analisi Deficit in riferimento a FS(progetto) = 1.100

Sup N.	FS	FTR(kN/m)	FTA(kN/m)	Bilancio(kN/m)	ESITO
1	1.434	3569.2	2489.7	830.5	Surplus
2	1.435	3509.5	2445.5	819.4	Surplus
3	1.436	3881.7	2703.7	907.6	Surplus
4	1.437	4109.5	2858.8	964.8	Surplus
5	1.440	3445.8	2393.4	813.1	Surplus
6	1.440	3907.8	2714.2	922.2	Surplus
7	1.440	4161.6	2890.2	982.4	Surplus
8	1.440	3781.2	2625.3	893.4	Surplus
9	1.441	3939.1	2733.9	931.8	Surplus
10	1.441	3489.2	2421.6	825.5	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 813.1

Note: FTR --> Forza totale Resistente lungo la superficie di scivolamento

FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA rispetto al fronte della scarpata

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TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi ' (°)	(c',Cu) (kPa)
22.779	0.401	2.40	0.35	0.00	0.00	30.00	7.00
23.180	0.432	2.40	1.59	0.00	0.00	30.00	7.00
23.612	0.432	2.40	3.27	0.00	0.00	30.00	7.00
24.044	0.432	2.40	4.96	0.00	0.00	30.00	7.00
24.476	0.432	2.40	6.64	0.00	0.00	30.00	7.00
24.908	0.328	2.40	6.17	0.00	0.00	30.00	7.00
25.236	0.432	2.40	9.60	0.00	0.00	26.00	7.00
25.668	0.432	2.40	11.27	0.00	0.00	26.00	7.00
26.100	0.432	2.40	12.95	0.00	0.00	26.00	7.00
26.533	0.432	2.40	14.62	0.00	0.00	26.00	7.00
26.965	0.293	2.40	10.85	0.00	0.00	26.00	7.00
27.257	0.403	2.88	16.17	0.00	0.00	26.00	7.00
27.660	0.432	2.88	20.70	0.00	0.00	26.00	7.00
28.092	0.432	2.88	25.86	0.00	0.00	26.00	7.00

28.524	0.432	2.88	31.02	0.00	0.00	26.00	7.00
28.956	0.244	2.88	19.78	0.00	0.00	26.00	7.00
29.200	0.316	2.88	26.94	0.00	0.00	26.00	7.00
29.516	0.432	3.78	37.36	0.00	0.00	26.00	7.00
29.949	0.432	3.78	38.00	0.00	0.00	26.00	7.00
30.381	0.432	3.78	38.65	0.00	0.00	26.00	7.00
30.813	0.289	3.78	26.21	0.00	0.00	26.00	7.00
31.102	0.432	4.75	39.68	0.00	0.00	26.00	7.00
31.534	0.432	4.75	40.25	0.00	0.00	26.00	7.00
31.966	0.432	4.75	40.83	0.00	0.00	26.00	7.00
32.398	0.103	4.75	9.86	0.00	0.00	26.00	7.00
32.501	0.432	5.96	41.49	0.00	0.00	26.00	7.00
32.933	0.432	5.96	41.98	0.00	0.00	26.00	7.00
33.365	0.413	5.96	40.60	0.00	0.00	26.00	7.00
33.779	0.432	6.88	42.89	0.00	0.00	26.00	7.00
34.211	0.432	6.88	43.31	0.00	0.00	26.00	7.00
34.643	0.387	6.88	39.13	0.00	0.00	26.00	7.00
35.030	0.432	7.80	44.06	0.00	0.00	26.00	7.00
35.462	0.432	7.80	44.41	0.00	0.00	26.00	7.00
35.894	0.411	7.80	42.59	0.00	0.00	26.00	7.00
36.305	0.432	8.67	45.06	0.00	0.00	26.00	7.00
36.737	0.432	8.67	45.35	0.00	0.00	26.00	7.00
37.169	0.432	8.67	45.63	0.00	0.00	26.00	7.00
37.601	0.008	8.67	0.85	0.00	0.00	26.00	7.00
37.609	0.432	9.47	45.90	0.00	0.00	26.00	7.00
38.041	0.189	9.47	20.11	0.00	0.00	26.00	7.00
38.230	0.432	9.47	46.50	0.00	0.00	26.00	7.00
38.662	0.325	9.47	35.52	0.00	0.00	26.00	7.00
38.987	0.432	10.06	47.86	0.00	0.00	26.00	7.00
39.419	0.432	10.06	48.60	0.00	0.00	26.00	7.00
39.851	0.432	10.06	49.35	0.00	0.00	26.00	7.00
40.283	0.021	10.06	2.40	0.00	0.00	26.00	7.00
40.304	0.432	10.69	50.11	0.00	0.00	26.00	7.00
40.736	0.432	10.69	50.80	0.00	0.00	26.00	7.00
41.168	0.112	10.69	13.23	0.00	0.00	26.00	7.00
41.280	0.313	10.69	37.35	0.00	0.00	26.00	7.00
41.593	0.432	11.33	51.98	0.00	0.00	26.00	7.00
42.025	0.432	11.33	52.49	0.00	0.00	26.00	7.00
42.457	0.405	11.33	49.67	0.00	0.00	26.00	7.00
42.862	0.432	11.98	53.44	0.00	0.00	26.00	7.00
43.294	0.432	11.98	53.90	0.00	0.00	26.00	7.00
43.727	0.113	11.98	14.23	0.00	0.00	26.00	7.00
43.840	0.303	11.98	38.38	0.00	0.00	26.00	7.00
44.143	0.432	12.62	55.57	0.00	0.00	26.00	7.00
44.576	0.432	12.62	56.65	0.00	0.00	26.00	7.00
45.008	0.405	12.62	54.02	0.00	0.00	26.00	7.00
45.412	0.432	13.26	58.70	0.00	0.00	26.00	7.00
45.844	0.432	13.26	59.73	0.00	0.00	26.00	7.00
46.276	0.423	13.26	59.50	0.00	0.00	26.00	7.00
46.700	0.432	13.87	61.74	0.00	0.00	26.00	7.00
47.132	0.432	13.87	62.72	0.00	0.00	26.00	7.00
47.564	0.026	13.87	3.84	0.00	0.00	26.00	7.00
47.590	0.424	13.87	63.18	0.00	0.00	26.00	7.00

48.014	0.432	14.44	66.72	0.00	0.00	26.00	7.00
48.446	0.432	14.44	69.02	0.00	0.00	26.00	7.00
48.878	0.432	14.44	71.31	0.00	0.00	26.00	7.00
49.310	0.076	14.44	12.78	0.00	0.00	26.00	7.00
49.386	0.432	15.19	73.99	0.00	0.00	26.00	7.00
49.818	0.002	15.19	0.33	0.00	0.00	26.00	7.00
49.820	0.432	15.19	75.13	0.00	0.00	26.00	7.00
50.252	0.432	15.19	75.15	0.00	0.00	26.00	7.00
50.684	0.007	15.19	1.19	0.00	0.00	26.00	7.00
50.691	0.432	15.99	75.14	0.00	0.00	26.00	7.00
51.123	0.432	15.99	75.09	0.00	0.00	26.00	7.00
51.555	0.414	15.99	71.95	0.00	0.00	26.00	7.00
51.969	0.432	16.82	74.97	0.00	0.00	26.00	7.00
52.401	0.432	16.82	74.87	0.00	0.00	26.00	7.00
52.834	0.392	16.82	67.90	0.00	0.00	26.00	7.00
53.226	0.432	17.64	74.63	0.00	0.00	26.00	7.00
53.658	0.432	17.64	74.45	0.00	0.00	26.00	7.00
54.090	0.414	17.64	71.15	0.00	0.00	26.00	7.00
54.504	0.432	18.48	74.08	0.00	0.00	26.00	7.00
54.936	0.432	18.48	73.84	0.00	0.00	26.00	7.00
55.368	0.404	18.48	68.78	0.00	0.00	26.00	7.00
55.772	0.432	19.29	73.34	0.00	0.00	26.00	7.00
56.204	0.186	19.29	31.51	0.00	0.00	26.00	7.00
56.390	0.432	19.29	72.81	0.00	0.00	26.00	7.00
56.822	0.251	19.29	41.98	0.00	0.00	26.00	7.00
57.073	0.432	20.05	71.97	0.00	0.00	26.00	7.00
57.505	0.432	20.05	71.40	0.00	0.00	26.00	7.00
57.937	0.432	20.05	70.83	0.00	0.00	26.00	7.00
58.369	0.056	20.05	9.16	0.00	0.00	26.00	7.00
58.425	0.432	20.73	70.16	0.00	0.00	26.00	7.00
58.857	0.432	20.73	69.54	0.00	0.00	26.00	7.00
59.289	0.432	20.73	68.91	0.00	0.00	26.00	7.00
59.721	0.160	20.73	25.32	0.00	0.00	26.00	7.00
59.881	0.195	22.53	30.83	0.00	0.00	26.00	7.00
60.076	0.432	22.53	67.71	0.00	0.00	22.00	25.00
60.508	0.432	22.53	67.09	0.00	0.00	22.00	25.00
60.940	0.231	22.53	35.66	0.00	0.00	22.00	25.00
61.172	0.432	24.60	66.07	0.00	0.00	22.00	25.00
61.604	0.432	24.60	65.29	0.00	0.00	22.00	25.00
62.036	0.375	24.60	56.09	0.00	0.00	22.00	25.00
62.411	0.432	26.80	63.75	0.00	0.00	22.00	25.00
62.843	0.432	26.80	62.79	0.00	0.00	22.00	25.00
63.275	0.320	26.80	45.92	0.00	0.00	22.00	25.00
63.596	0.432	28.90	61.04	0.00	0.00	22.00	25.00
64.028	0.342	28.90	47.56	0.00	0.00	22.00	25.00
64.370	0.432	28.90	58.61	0.00	0.00	22.00	25.00
64.802	0.050	28.90	6.68	0.00	0.00	22.00	25.00
64.852	0.432	31.49	56.34	0.00	0.00	22.00	25.00
65.284	0.432	31.49	54.17	0.00	0.00	22.00	25.00
65.716	0.432	31.49	52.01	0.00	0.00	22.00	25.00
66.148	0.035	31.49	4.08	0.00	0.00	22.00	25.00
66.183	0.432	33.49	49.57	0.00	0.00	22.00	25.00
66.615	0.285	33.49	31.40	0.00	0.00	22.00	25.00



66.900	0.020	33.49	4.23	0.00	0.00	22.00	25.00
66.920	0.432	33.49	90.09	0.00	0.00	22.00	25.00
67.352	0.379	33.49	77.09	0.00	0.00	22.00	25.00
67.731	0.432	35.15	85.58	0.00	0.00	22.00	25.00
68.163	0.432	35.15	83.06	0.00	0.00	22.00	25.00
68.595	0.432	35.15	80.54	0.00	0.00	22.00	25.00
69.027	0.333	35.15	60.29	0.00	0.00	22.00	25.00
69.360	0.432	35.15	76.02	0.00	0.00	22.00	25.00
69.792	0.193	35.15	33.06	0.00	0.00	22.00	25.00
69.985	0.432	35.95	72.16	0.00	0.00	22.00	25.00
70.417	0.432	35.95	69.44	0.00	0.00	22.00	25.00
70.849	0.432	35.95	66.72	0.00	0.00	22.00	25.00
71.281	0.432	35.95	64.00	0.00	0.00	22.00	25.00
71.713	0.432	35.95	61.28	0.00	0.00	22.00	25.00
72.145	0.432	35.95	58.56	0.00	0.00	22.00	25.00
72.577	0.432	35.95	55.84	0.00	0.00	22.00	25.00
73.009	0.432	35.95	53.12	0.00	0.00	22.00	25.00
73.441	0.432	35.95	50.40	0.00	0.00	22.00	25.00
73.873	0.432	35.95	47.68	0.00	0.00	22.00	25.00
74.306	0.284	35.95	29.89	0.00	0.00	22.00	25.00

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 LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
 dx(m) : Larghezza concio  
 alpha (°) : Angolo pendenza base concio  
 W(kN/m) : Forza peso concio  
 ru(-) : Coefficiente locale pressione interstiziale  
 U(kPa) : Pressione totale dei pori base concio  
 phi' (°) : Angolo di attrito efficace base concio  
 c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate  
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TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS  
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X (m)	ht (m)	yt (m)	yt' (--)	E(x) (kN/m)	T(x) (kN/m)	E' (kN)	rho(x) (--)	FS_qFEM (--)	FS_srmFEM (--)
22.779	0.000	4.899	0.120	0.0000000000E+000	0.0000000000E+000	6.73051450509E+001	0.048	29.878	1.241
23.180	0.021	4.937	0.120	1.9053124169E+001	4.3885753668E-002	2.7646981901E+001	0.048	29.878	1.241
23.612	0.065	5.000	0.150	2.1774506198E+001	1.5751339611E-001	7.2994357004E+000	0.048	22.323	0.945
24.044	0.114	5.067	0.154	2.5360905769E+001	4.3928719588E-001	8.8091952307E+000	0.048	18.840	0.887
24.476	0.162	5.133	0.152	2.9386941169E+001	9.0407974081E-001	9.6049039386E+000	0.069	10.056	0.909
24.908	0.209	5.198	0.157	3.3660949612E+001	1.5774383064E+000	1.0886483713E+001	0.103	6.447	0.972
25.236	0.250	5.252	0.171	3.7479906415E+001	2.3363279368E+000	1.1906810641E+001	0.136	5.095	0.954
25.668	0.307	5.327	0.190	4.2775432506E+001	3.5762185595E+000	1.2714194465E+001	0.180	4.197	1.073
26.100	0.377	5.416	0.217	4.8466832694E+001	5.0749325364E+000	1.3717869576E+001	0.224	3.721	1.206
26.533	0.458	5.515	0.235	5.4629681090E+001	6.7359869209E+000	1.4645132641E+001	0.263	3.409	1.355
26.965	0.545	5.620	0.246	6.1122372383E+001	8.6128126170E+000	1.5437447656E+001	0.300	3.192	1.539
27.257	0.606	5.694	0.261	6.5720945354E+001	1.0005605292E+001	1.6125448474E+001	0.325	3.081	1.681
27.660	0.694	5.801	0.280	7.2442837631E+001	1.2133408697E+001	1.7714591320E+001	0.358	2.961	1.892
28.092	0.798	5.927	0.289	8.0571914062E+001	1.4798156399E+001	1.9101118743E+001	0.377	2.855	2.116

28.524	0.900	6.051	0.281	8.8949001986E+001	1.7598767840E+001	1.9783882037E+001	0.393	2.772	2.291
28.956	0.997	6.170	0.268	9.7668085907E+001	2.0539446775E+001	2.0193900319E+001	0.408	2.695	2.404
29.200	1.047	6.232	0.256	1.0259292177E+002	2.2206771665E+001	2.1614381758E+001	0.415	2.653	2.440
29.516	1.113	6.314	0.247	1.1001310163E+002	2.4719018681E+001	2.3760230457E+001	0.439	2.587	2.448
29.949	1.187	6.417	0.229	1.2046352524E+002	2.8258417012E+001	2.4435210248E+001	0.469	2.497	2.421
30.381	1.254	6.512	0.204	1.3112870233E+002	3.1857332499E+001	2.4378297349E+001	0.497	2.408	2.367
30.813	1.306	6.593	0.178	1.4152994486E+002	3.5339934916E+001	2.3509536675E+001	0.520	2.321	2.297
31.102	1.334	6.640	0.159	1.4821489301E+002	3.7563457981E+001	2.3376566882E+001	0.533	2.266	2.252
31.534	1.366	6.708	0.154	1.5847278207E+002	4.0967333218E+001	2.3861664002E+001	0.551	2.183	2.188
31.966	1.396	6.773	0.149	1.6883486575E+002	4.4405014897E+001	2.3839275433E+001	0.568	2.102	2.129
32.398	1.423	6.837	0.145	1.7907340780E+002	4.7811428489E+001	2.1787263473E+001	0.584	2.026	2.076
32.501	1.429	6.851	0.139	1.8127948124E+002	4.8548802169E+001	2.1369705678E+001	0.587	2.010	2.065
32.933	1.444	6.911	0.144	1.9058389077E+002	5.1679348639E+001	2.1734460576E+001	0.600	1.943	2.020
33.365	1.463	6.975	0.151	2.0006123865E+002	5.4914296170E+001	2.2062907569E+001	0.613	1.880	1.974
33.779	1.483	7.039	0.159	2.0922936135E+002	5.8098332715E+001	2.2317449103E+001	0.625	1.822	1.930
34.211	1.502	7.110	0.169	2.1893168109E+002	6.1534894388E+001	2.2657478992E+001	0.638	1.764	1.883
34.643	1.526	7.185	0.181	2.2880874186E+002	6.5116532639E+001	2.3145594826E+001	0.651	1.711	1.834
35.030	1.551	7.258	0.194	2.3786300095E+002	6.8457366129E+001	2.3682233442E+001	0.663	1.665	1.790
35.462	1.579	7.345	0.197	2.4823086316E+002	7.2343359737E+001	2.3018142201E+001	0.676	1.617	1.742
35.894	1.604	7.429	0.189	2.5775404730E+002	7.5969191074E+001	2.0887337821E+001	0.688	1.577	1.700
36.305	1.623	7.504	0.182	2.6589155195E+002	7.9107415356E+001	1.9117079164E+001	0.698	1.546	1.666
36.737	1.635	7.582	0.179	2.7384614359E+002	8.2217868625E+001	1.7813186452E+001	0.707	1.518	1.635
37.169	1.646	7.659	0.186	2.8128475416E+002	8.5180259614E+001	1.7228589048E+001	0.716	1.494	1.609
37.601	1.664	7.742	0.193	2.8873416801E+002	8.8235717325E+001	1.6948218266E+001	0.726	1.472	1.585
37.609	1.664	7.744	0.194	2.8886979830E+002	8.8292507884E+001	1.6927442452E+001	0.726	1.472	1.585
38.041	1.676	7.828	0.202	2.9582572734E+002	9.1237829752E+001	1.6980099912E+001	0.735	1.453	1.565
38.230	1.686	7.869	0.223	2.9910090633E+002	9.2669707941E+001	1.7180501816E+001	0.740	1.445	1.557
38.662	1.711	7.966	0.224	3.0634178172E+002	9.5915097205E+001	1.6377028526E+001	0.749	1.429	1.540
38.987	1.729	8.039	0.229	3.1157421016E+002	9.8323001040E+001	1.6050719673E+001	0.755	1.418	1.530
39.419	1.753	8.140	0.234	3.1848677147E+002	1.0158436402E+002	1.5847455590E+001	0.764	1.404	1.517
39.851	1.779	8.242	0.238	3.2526873298E+002	1.0487579566E+002	1.5529063006E+001	0.773	1.392	1.506
40.283	1.806	8.346	0.241	3.3190615646E+002	1.0818228582E+002	1.5796302889E+001	0.782	1.382	1.496
40.304	1.807	8.351	0.255	3.3223527837E+002	1.0834831747E+002	1.5809394659E+001	0.783	1.381	1.496
40.736	1.836	8.461	0.261	3.3899581756E+002	1.1183384625E+002	1.5573713917E+001	0.793	1.372	1.488
41.168	1.869	8.576	0.265	3.4569324830E+002	1.1542555305E+002	1.4992113249E+001	0.803	1.364	1.482
41.280	1.877	8.605	0.256	3.4735103634E+002	1.1632726629E+002	1.4663265253E+001	0.806	1.362	1.481
41.593	1.898	8.685	0.260	3.5176890895E+002	1.1878595155E+002	1.4144001642E+001	0.808	1.358	1.478
42.025	1.925	8.799	0.269	3.5790115985E+002	1.2229191482E+002	1.4089548467E+001	0.811	1.353	1.475
42.457	1.957	8.917	0.280	3.6394434253E+002	1.2588258670E+002	1.4001602863E+001	0.814	1.348	1.473
42.862	1.992	9.033	0.295	3.6962224224E+002	1.2939146683E+002	1.4051656853E+001	0.819	1.345	1.471
43.294	2.031	9.164	0.303	3.7571011848E+002	1.3332837477E+002	1.3671309780E+001	0.824	1.341	1.469
43.727	2.070	9.295	0.302	3.8143625634E+002	1.3725797136E+002	1.2629243182E+001	0.830	1.339	1.467
43.840	2.080	9.329	0.309	3.8285071723E+002	1.3826917616E+002	1.2453426829E+001	0.832	1.338	1.466
44.143	2.110	9.424	0.333	3.8662018058E+002	1.4110470498E+002	1.2630950062E+001	0.833	1.336	1.463
44.576	2.164	9.574	0.357	3.9220676638E+002	1.4566150887E+002	1.2648290981E+001	0.837	1.334	1.456
45.008	2.225	9.732	0.371	3.9755015660E+002	1.5051926077E+002	1.2205821375E+001	0.843	1.332	1.445
45.412	2.288	9.885	0.387	4.0242764941E+002	1.5527643202E+002	1.1913541888E+001	0.850	1.331	1.432
45.844	2.357	10.056	0.408	4.0750989312E+002	1.6060606999E+002	1.1659200470E+001	0.858	1.329	1.414
46.276	2.437	10.237	0.448	4.1250290635E+002	1.6625297102E+002	1.1721535533E+001	0.868	1.328	1.392
46.700	2.538	10.439	0.492	4.1753245218E+002	1.7238416734E+002	1.1684915807E+001	0.879	1.327	1.366
47.132	2.651	10.658	0.482	4.2249348998E+002	1.7885833450E+002	1.10409842324E+001	0.892	1.326	1.336
47.564	2.742	10.856	0.459	4.2652808069E+002	1.8447208066E+002	9.6388156292E+000	0.902	1.325	1.309
47.590	2.749	10.869	0.484	4.2678164021E+002	1.8483410066E+002	9.6118348131E+000	0.903	1.325	1.307

48.014	2.848	11.073	0.473	4.3054544685E+002	1.9030804700E+002	8.4360224975E+000	0.901	1.323	1.280
48.446	2.938	11.274	0.450	4.3399439784E+002	1.9545052335E+002	7.5253753297E+000	0.898	1.322	1.255
48.878	3.015	11.463	0.422	4.3704847338E+002	2.0006105581E+002	6.6457995219E+000	0.893	1.321	1.233
49.310	3.080	11.639	0.407	4.3973734205E+002	2.0412060443E+002	5.9921138374E+000	0.887	1.318	1.214
49.386	3.091	11.669	0.380	4.4018971619E+002	2.0480079790E+002	5.8537906390E+000	0.886	1.318	1.211
49.818	3.136	11.832	0.376	4.4247908757E+002	2.0822929849E+002	5.2278868708E+000	0.877	1.315	1.195
49.820	3.136	11.832	0.357	4.4248898661E+002	2.0824396793E+002	5.2254965444E+000	0.877	1.315	1.195
50.252	3.173	11.987	0.355	4.4454166871E+002	2.1123196126E+002	4.5529962687E+000	0.882	1.311	1.182
50.684	3.209	12.139	0.354	4.4642344227E+002	2.1390300737E+002	4.2830375621E+000	0.886	1.307	1.170
50.691	3.209	12.142	0.314	4.4645272588E+002	2.1394422507E+002	4.2656459398E+000	0.886	1.307	1.169
51.123	3.221	12.277	0.314	4.4785223371E+002	2.1583711324E+002	2.9655134781E+000	0.888	1.302	1.161
51.555	3.233	12.413	0.320	4.4901536389E+002	2.1732882505E+002	2.4256109027E+000	0.888	1.296	1.153
51.969	3.249	12.548	0.336	4.4991435253E+002	2.1842998118E+002	1.8735008968E+000	0.887	1.291	1.147
52.401	3.268	12.698	0.346	4.5059010525E+002	2.1924116294E+002	1.1115423751E+000	0.885	1.285	1.142
52.834	3.287	12.847	0.342	4.5087488795E+002	2.1955841275E+002	1.2633929326E-001	0.882	1.279	1.139
53.226	3.300	12.979	0.343	4.5073458892E+002	2.1938884821E+002	-9.0339787758E-001	0.877	1.275	1.137
53.658	3.314	13.130	0.349	4.5008456256E+002	2.1870988760E+002	-2.0343272161E+000	0.871	1.271	1.137
54.090	3.327	13.281	0.335	4.4897663223E+002	2.1760648503E+002	-2.9119847769E+000	0.864	1.269	1.140
54.504	3.328	13.413	0.316	4.4763370727E+002	2.1630944561E+002	-3.5648297606E+000	0.856	1.267	1.143
54.936	3.318	13.548	0.312	4.4594919195E+002	2.1474141652E+002	-4.2978056513E+000	0.848	1.267	1.147
55.368	3.308	13.683	0.313	4.4391977369E+002	2.1289860261E+002	-5.1214506061E+000	0.838	1.267	1.153
55.772	3.301	13.810	0.307	4.4169203862E+002	2.1091433906E+002	-5.6863043082E+000	0.829	1.267	1.160
56.204	3.279	13.939	0.298	4.3915735975E+002	2.0870463456E+002	-6.1061656887E+000	0.819	1.269	1.168
56.390	3.269	13.994	0.292	4.3800140914E+002	2.0770711248E+002	-6.3458640926E+000	0.815	1.269	1.172
56.822	3.243	14.120	0.297	4.3512278346E+002	2.0524887704E+002	-7.3319662379E+000	0.806	1.270	1.181
57.073	3.233	14.197	0.305	4.3318882055E+002	2.0362467956E+002	-7.8106531675E+000	0.800	1.271	1.187
57.505	3.206	14.328	0.298	4.2974663160E+002	2.0076246431E+002	-8.0395372543E+000	0.790	1.273	1.197
57.937	3.175	14.455	0.296	4.2624148280E+002	1.9787050430E+002	-8.3488653773E+000	0.780	1.277	1.208
58.369	3.146	14.584	0.297	4.2253198905E+002	1.9481495675E+002	-8.3765071834E+000	0.769	1.282	1.218
58.425	3.142	14.600	0.295	4.2206320468E+002	1.9443045386E+002	-8.4075965412E+000	0.767	1.282	1.219
58.857	3.106	14.728	0.299	4.1823690504E+002	1.9130062734E+002	-9.0649914264E+000	0.757	1.288	1.229
59.289	3.074	14.859	0.299	4.1422972433E+002	1.8800560417E+002	-9.2430913622E+000	0.745	1.296	1.239
59.721	3.038	14.986	0.295	4.1024952026E+002	1.8470538247E+002	-9.2939338063E+000	0.734	1.304	1.249
59.881	3.024	15.033	0.290	4.0875982285E+002	1.8346084647E+002	-9.2180959813E+000	0.729	1.308	1.252
60.076	2.999	15.089	0.297	4.0698446525E+002	1.8197406366E+002	-9.2874979190E+000	0.724	1.314	1.446
60.508	2.950	15.219	0.310	4.0278118719E+002	1.7837988419E+002	-1.0117000576E+001	0.717	1.326	1.459
60.940	2.908	15.357	0.325	3.9824189490E+002	1.7444215066E+002	-1.1065548530E+001	0.708	1.339	1.474
61.172	2.890	15.435	0.352	3.9561322537E+002	1.7215746361E+002	-1.1804768788E+001	0.703	1.346	1.482
61.604	2.848	15.591	0.373	3.9015787388E+002	1.6746330013E+002	-1.3466331689E+001	0.692	1.360	1.500
62.036	2.817	15.757	0.390	3.8397634236E+002	1.6234234174E+002	-1.4797449086E+001	0.680	1.375	1.519
62.411	2.794	15.905	0.402	3.7826129540E+002	1.5779213851E+002	-1.5726527155E+001	0.670	1.389	1.536
62.843	2.751	16.082	0.416	3.7121630254E+002	1.5248612790E+002	-1.7080444576E+001	0.658	1.403	1.555
63.275	2.717	16.265	0.413	3.6350128950E+002	1.4732619172E+002	-1.7613905568E+001	0.647	1.413	1.570
63.596	2.682	16.392	0.422	3.5791841120E+002	1.4403573877E+002	-1.8407012042E+001	0.641	1.417	1.576
64.028	2.634	16.582	0.436	3.4939833612E+002	1.3982645749E+002	-1.9816180432E+001	0.636	1.413	1.575
64.370	2.592	16.730	0.413	3.4258892664E+002	1.3698888346E+002	-1.9681808699E+001	0.634	1.405	1.567
64.802	2.526	16.902	0.396	3.3420019518E+002	1.3418934837E+002	-1.8390518961E+001	0.639	1.388	1.549
64.852	2.517	16.921	0.390	3.328394391E+002	1.3393353140E+002	-1.8502482053E+001	0.640	1.385	1.547
65.284	2.422	17.090	0.389	3.2443001302E+002	1.3172645878E+002	-2.1076870900E+001	0.651	1.360	1.520
65.716	2.324	17.257	0.384	3.1507044030E+002	1.2981189085E+002	-2.2455567067E+001	0.664	1.330	1.489
66.148	2.225	17.422	0.382	3.0502511399E+002	1.2794930678E+002	-2.3795627959E+001	0.680	1.297	1.455
66.183	2.216	17.435	0.395	3.0419919764E+002	1.2780128057E+002	-2.4076816934E+001	0.681	1.294	1.453
66.615	2.102	17.607	0.405	2.9251716598E+002	1.2559123355E+002	-2.9720243082E+001	0.699	1.259	1.416

66.900	2.032	17.725	0.417	2.8354773735E+002	1.2361442232E+002	-3.3624716208E+001	0.710	1.235	1.392
66.920	2.027	17.734	0.429	2.8287224396E+002	1.2345300808E+002	-3.3890506606E+001	0.711	1.234	1.390
67.352	1.927	17.920	0.436	2.6714779932E+002	1.1949582589E+002	-3.8401616803E+001	0.727	1.202	1.356
67.731	1.844	18.087	0.449	2.5192337440E+002	1.1509574166E+002	-4.1815070278E+001	0.738	1.177	1.331
68.163	1.737	18.284	0.448	2.3304293389E+002	1.0878309984E+002	-4.4314139498E+001	0.747	1.156	1.308
68.595	1.623	18.475	0.448	2.1362946714E+002	1.0124064769E+002	-4.6155830781E+001	0.750	1.144	1.295
69.027	1.515	18.671	0.459	1.9315753561E+002	9.2320192458E+001	-4.8485223650E+001	0.743	1.141	1.292
69.360	1.436	18.826	0.444	1.7674613071E+002	8.4539796116E+001	-4.7671055511E+001	0.730	1.146	1.298
69.792	1.315	19.010	0.426	1.5708290280E+002	7.4102329729E+001	-4.5054803493E+001	0.707	1.168	1.320
69.985	1.262	19.092	0.400	1.4843889759E+002	6.9239126725E+001	-4.3144684135E+001	0.692	1.183	1.336
70.417	1.116	19.260	0.388	1.3145128913E+002	5.9000103661E+001	-3.8222963444E+001	0.657	1.230	1.385
70.849	0.970	19.427	0.393	1.1540865862E+002	4.8976507980E+001	-3.6286243403E+001	0.613	1.296	1.454
71.281	0.829	19.599	0.403	1.0009465995E+002	3.9454822652E+001	-3.5880106338E+001	0.563	1.379	1.540
71.713	0.692	19.776	0.429	8.4402991346E+001	2.9393376175E+001	-3.7080288496E+001	0.488	1.497	1.665
72.145	0.572	19.969	0.442	6.8051859504E+001	1.8983475807E+001	-3.5224749232E+001	0.379	1.678	1.855
72.577	0.447	20.157	0.441	5.3963648605E+001	1.0898859451E+001	-3.0952465344E+001	0.268	1.903	2.089
73.009	0.327	20.350	0.465	4.1304395808E+001	5.0663205530E+000	-2.8666005019E+001	0.160	2.207	2.400
73.441	0.222	20.559	0.501	2.9192021530E+001	1.6366673101E+000	-2.7541033177E+001	0.072	2.566	2.745
73.873	0.133	20.784	0.529	1.7504909181E+001	3.7331801063E-001	-2.6230462206E+001	0.048	2.725	2.828
74.306	0.052	21.016	0.529	6.5250601818E+000	5.6188109839E-002	-2.3926697777E+001	0.048	1.460	1.416

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 LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
 ht(m) : Altezza linea di thrust da nodo sinistro base concio  
 yt(m) : coordinata Y linea di trust  
 yt' (-) : gradiente pendenza locale linea di trust  
 E(x) (kN/m) : Forza Normale interconcio  
 T(x) (kN/m) : Forza Tangenziale interconcio  
 E' (kN) : derivata Forza normale interconcio  
 Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)  
 FS\_qFEM(x) (-) : fattore di sicurezza locale stimato (locale in X) by qFEM  
 FS\_srmFEM(x) (-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure  
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TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
22.779	0.401	0.402	2.405	0.089	0.036	7.553	3.034
23.180	0.432	0.432	2.405	0.378	0.164	9.250	4.000
23.612	0.432	0.432	2.405	0.779	0.337	11.692	5.056
24.044	0.432	0.432	2.405	1.180	0.510	14.152	6.120
24.476	0.432	0.432	2.405	1.581	0.684	16.642	7.197
24.908	0.328	0.328	2.405	1.933	0.635	19.004	6.240
25.236	0.432	0.432	2.405	2.284	0.988	19.015	8.223
25.668	0.432	0.432	2.405	2.683	1.160	21.151	9.147
26.100	0.432	0.432	2.405	3.081	1.332	23.191	10.029
26.533	0.432	0.432	2.405	3.479	1.504	25.285	10.934
26.965	0.293	0.293	2.405	3.812	1.117	27.039	7.919
27.257	0.403	0.403	2.880	4.459	1.798	28.668	11.561

27.660	0.432	0.433	2.880	5.318	2.301	32.790	14.185
28.092	0.432	0.433	2.880	6.645	2.875	38.716	16.749
28.524	0.432	0.433	2.880	7.972	3.449	44.647	19.315
28.956	0.244	0.244	2.880	9.010	2.199	49.194	12.008
29.200	0.316	0.317	2.880	9.451	2.994	51.576	16.342
29.516	0.432	0.433	3.780	10.939	4.737	52.025	22.528
29.949	0.432	0.433	3.780	11.127	4.818	52.799	22.863
30.381	0.432	0.433	3.780	11.315	4.900	53.413	23.129
30.813	0.289	0.290	3.780	11.473	3.323	53.870	15.601
31.102	0.432	0.434	4.754	13.150	5.701	54.144	23.475
31.534	0.432	0.434	4.754	13.339	5.783	54.811	23.764
31.966	0.432	0.434	4.754	13.529	5.866	55.423	24.029
32.398	0.103	0.104	4.754	13.646	1.416	55.542	5.764
32.501	0.432	0.434	5.961	15.714	6.827	55.459	24.093
32.933	0.432	0.434	5.961	15.898	6.906	56.077	24.361
33.365	0.413	0.415	5.961	16.077	6.680	56.676	23.548
33.779	0.432	0.435	6.881	17.776	7.736	56.836	24.735
34.211	0.432	0.435	6.881	17.948	7.811	57.401	24.981
34.643	0.387	0.390	6.881	18.112	7.059	57.944	22.582
35.030	0.432	0.436	7.797	19.814	8.641	57.989	25.289
35.462	0.432	0.436	7.797	19.971	8.710	58.201	25.382
35.894	0.411	0.415	7.797	20.125	8.352	58.359	24.221
36.305	0.432	0.437	8.670	21.760	9.511	58.144	25.413
36.737	0.432	0.437	8.670	21.898	9.571	58.366	25.510
37.169	0.432	0.437	8.670	22.035	9.631	58.734	25.671
37.601	0.008	0.008	8.670	22.106	0.179	58.899	0.477
37.609	0.432	0.438	9.473	23.547	10.315	58.540	25.643
38.041	0.189	0.191	9.473	23.630	4.519	58.903	11.263
38.230	0.432	0.438	9.473	23.858	10.451	59.366	26.005
38.662	0.325	0.330	9.473	24.212	7.983	60.091	19.812
38.987	0.432	0.439	10.062	25.605	11.236	60.517	26.556
39.419	0.432	0.439	10.062	26.003	11.411	61.339	26.917
39.851	0.432	0.439	10.062	26.402	11.586	62.152	27.274
40.283	0.021	0.021	10.062	26.610	0.562	62.649	1.324
40.304	0.432	0.440	10.688	27.965	12.296	62.677	27.559
40.736	0.432	0.440	10.688	28.354	12.467	63.480	27.912
41.168	0.112	0.114	10.688	28.599	3.247	63.905	7.255
41.280	0.313	0.319	10.688	28.761	9.165	64.169	20.448
41.593	0.432	0.441	11.333	30.238	13.325	64.289	28.330
42.025	0.432	0.441	11.333	30.532	13.454	64.868	28.585
42.457	0.405	0.413	11.333	30.816	12.732	65.459	27.045
42.862	0.432	0.442	11.979	32.333	14.281	65.582	28.967
43.294	0.432	0.442	11.979	32.609	14.403	66.065	29.180
43.727	0.113	0.116	11.979	32.783	3.803	66.339	7.695
43.840	0.303	0.310	11.979	33.058	10.256	66.900	20.754
44.143	0.432	0.443	12.621	34.895	15.451	67.595	29.929
44.576	0.432	0.443	12.621	35.570	15.749	68.845	30.483
45.008	0.405	0.415	12.621	36.223	15.019	70.030	29.036
45.412	0.432	0.444	13.256	38.177	16.947	70.632	31.354
45.844	0.432	0.444	13.256	38.844	17.243	71.819	31.880
46.276	0.423	0.435	13.256	39.505	17.177	73.091	31.781
46.700	0.432	0.445	13.868	41.466	18.454	73.588	32.750
47.132	0.432	0.445	13.868	42.124	18.747	74.364	33.095

47.564	0.026	0.027	13.868	42.473	1.149	75.008	2.029
47.590	0.424	0.437	13.868	43.265	18.886	76.134	33.235
48.014	0.432	0.446	14.440	46.121	20.578	77.841	34.730
48.446	0.432	0.446	14.440	47.710	21.287	80.100	35.738
48.878	0.432	0.446	14.440	49.300	21.996	82.355	36.744
49.310	0.076	0.078	14.440	50.235	3.943	83.714	6.571
49.386	0.432	0.448	15.192	53.034	23.744	84.225	37.709
49.818	0.002	0.002	15.192	53.841	0.106	85.371	0.168
49.820	0.432	0.448	15.192	53.851	24.110	85.310	38.195
50.252	0.432	0.448	15.192	53.865	24.116	85.262	38.173
50.684	0.007	0.007	15.192	53.872	0.382	85.258	0.604
50.691	0.432	0.449	15.994	55.862	25.109	84.317	37.898
51.123	0.432	0.449	15.994	55.830	25.094	84.206	37.848
51.555	0.414	0.431	15.994	55.798	24.044	84.106	36.242
51.969	0.432	0.451	16.821	57.766	26.075	83.209	37.559
52.401	0.432	0.451	16.821	57.682	26.037	83.042	37.484
52.834	0.392	0.410	16.821	57.602	23.614	82.879	33.977
53.226	0.432	0.453	17.642	59.452	26.956	81.973	37.166
53.658	0.432	0.453	17.642	59.314	26.893	81.770	37.074
54.090	0.414	0.434	17.642	59.179	25.699	81.583	35.428
54.504	0.432	0.456	18.476	60.942	27.762	80.664	36.747
54.936	0.432	0.456	18.476	60.745	27.672	80.420	36.636
55.368	0.404	0.426	18.476	60.554	25.775	80.184	34.131
55.772	0.432	0.458	19.286	62.144	28.447	79.249	36.277
56.204	0.186	0.197	19.286	61.959	12.220	79.037	15.588
56.390	0.432	0.458	19.286	61.689	28.239	78.727	36.038
56.822	0.251	0.265	19.286	61.349	16.282	78.342	20.792
57.073	0.432	0.460	20.052	62.619	28.802	77.305	35.557
57.505	0.432	0.460	20.052	62.124	28.574	76.753	35.303
57.937	0.432	0.460	20.052	61.628	28.346	76.210	35.053
58.369	0.056	0.060	20.052	61.348	3.667	75.889	4.536
58.425	0.432	0.462	20.735	62.432	28.843	75.022	34.660
58.857	0.432	0.462	20.735	61.875	28.586	74.437	34.390
59.289	0.432	0.462	20.735	61.319	28.329	73.834	34.111
59.721	0.160	0.171	20.735	60.937	10.410	73.428	12.544
59.881	0.195	0.211	22.530	64.072	13.550	71.708	15.165
60.076	0.432	0.468	22.530	63.618	29.759	79.005	36.956
60.508	0.432	0.468	22.530	63.039	29.488	78.655	36.793
60.940	0.231	0.250	22.530	62.595	15.674	78.411	19.634
61.172	0.432	0.475	24.599	65.584	31.166	76.913	36.549
61.604	0.432	0.475	24.599	64.813	30.799	76.535	36.369
62.036	0.375	0.413	24.599	64.092	26.462	76.045	31.397
62.411	0.432	0.484	26.800	66.547	32.213	74.160	35.899
62.843	0.432	0.484	26.800	65.551	31.731	73.385	35.523
63.275	0.320	0.359	26.800	64.683	23.205	72.360	25.959
63.596	0.432	0.494	28.895	66.374	32.757	70.171	34.630
64.028	0.342	0.391	28.895	65.273	25.520	69.038	26.992
64.370	0.432	0.494	28.895	63.733	31.453	67.520	33.322
64.802	0.050	0.057	28.895	62.557	3.583	66.362	3.801
64.852	0.432	0.507	31.492	63.862	32.359	63.635	32.244
65.284	0.432	0.507	31.492	61.407	31.115	61.984	31.407
65.716	0.432	0.507	31.492	58.952	29.871	60.525	30.668
66.148	0.035	0.041	31.492	57.626	2.341	59.746	2.427

66.183	0.432	0.518	33.487	57.665	29.874	57.880	29.985
66.615	0.285	0.342	33.487	55.398	18.920	57.354	19.588
66.900	0.020	0.024	33.487	106.226	2.547	85.057	2.040
66.920	0.432	0.518	33.487	104.791	54.288	84.698	43.879
67.352	0.379	0.454	33.487	102.215	46.457	84.244	38.289
67.731	0.432	0.528	35.151	101.316	53.540	82.114	43.392
68.163	0.432	0.528	35.151	98.334	51.964	81.759	43.205
68.595	0.432	0.528	35.151	95.352	50.388	81.543	43.091
69.027	0.333	0.407	35.151	92.714	37.720	81.320	33.084
69.360	0.432	0.528	35.151	90.002	47.561	80.260	42.413
69.792	0.193	0.236	35.151	87.741	20.681	79.554	18.751
69.985	0.432	0.534	35.953	86.055	45.932	77.135	41.171
70.417	0.432	0.534	35.953	82.810	44.200	75.333	40.209
70.849	0.432	0.534	35.953	79.566	42.468	73.256	39.101
71.281	0.432	0.534	35.953	76.321	40.736	72.183	38.528
71.713	0.432	0.534	35.953	73.076	39.005	70.926	37.857
72.145	0.432	0.534	35.953	69.832	37.273	67.090	35.809
72.577	0.432	0.534	35.953	66.587	35.541	63.325	33.800
73.009	0.432	0.534	35.953	63.343	33.809	59.415	31.713
73.441	0.432	0.534	35.953	60.098	32.077	55.733	29.748
73.873	0.432	0.534	35.953	56.853	30.346	53.227	28.410
74.306	0.284	0.351	35.953	54.164	19.024	51.683	18.153

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LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
dx(m) : Larghezza concio  
dl(m) : lunghezza base concio  
alpha (°) : Angolo pendenza base concio  
TauStress(kPa) : Sforzo di taglio su base concio  
TauF (kN/m) : Forza di taglio su base concio  
TauStrength(kPa) : Resistenza al taglio su base concio  
TauS (kN/m) : Forza resistente al taglio su base concio

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## **STATO DI PROGETTO**

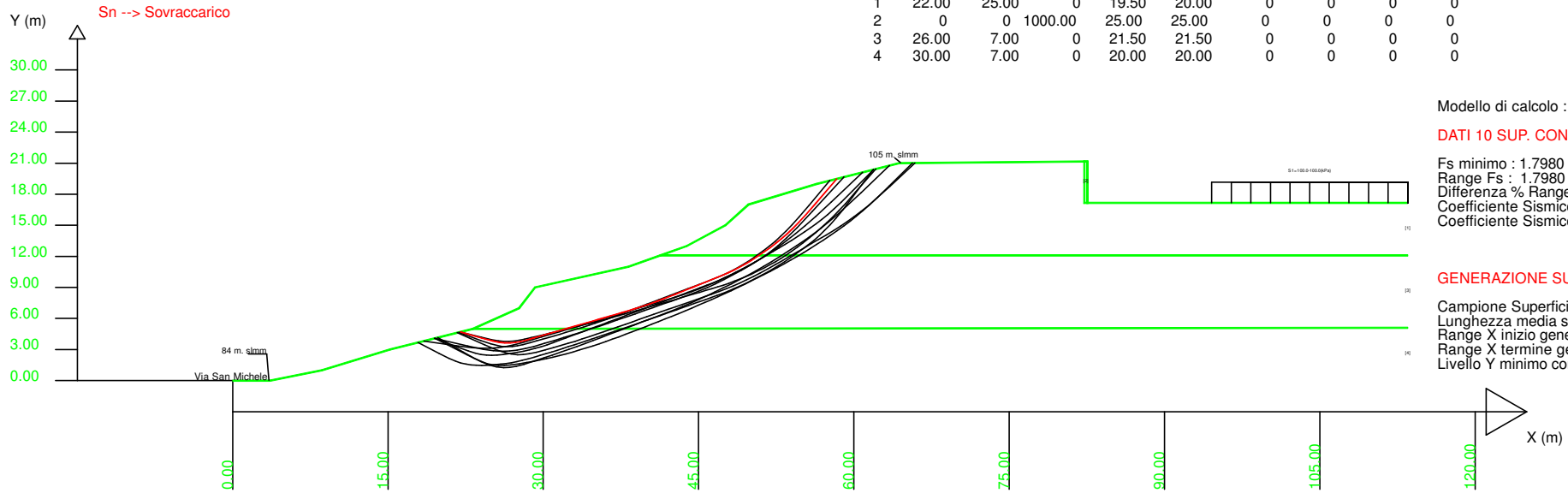


SSAP 5.0 (2020) - Slope Stability Analysis Program  
 Software by Dr.Geol. L.Borselli - www.lorenzo-borselli.eu  
 SSAP/DXF generator rel. 2.0 (2020)

Data : 10/11/2020  
 Localita' : San Sebastiano - S.Maria a Monte  
 Descrizione : Verifica di stabilitA del pendio stato di progetto in condizioni statiche drenate  
 [n] = N. strato o lente

# Parametri Geotecnici degli strati # -----

N.	phi`	C`	Cu	Gamm	GammSat	sgci	GSI	mi	D
..	deg	kPa	kPa	kN/m3	kN/m3	MPa	..	..	..
1	22.00	25.00	0	19.50	20.00	0	0	0	0
2	0	0	1000.00	25.00	25.00	0	0	0	0
3	26.00	7.00	0	21.50	21.50	0	0	0	0
4	30.00	7.00	0	20.00	20.00	0	0	0	0



Modello di calcolo : Morgenstern - Price (1965)

DATI 10 SUP. CON MINOR Fs

Fs minimo : 1.7980  
 Range Fs : 1.7980 - 1.8125  
 Differenza % Range Fs : 0.80  
 Coefficiente Sismico orizzontale - Kh: 0.0000  
 Coefficiente Sismico verticale - Kv: 0.0000

GENERAZIONE SUPERFICI RANDOM

Campione Superfici - N.: 10000  
 Lunghezza media segmenti (m) : 4.5  
 Range X inizio generazione : 2.3 - 25.7  
 Range X termine generazione : 54.0 - 111.2  
 Livello Y minimo considerato : 0.0

# Report elaborazioni #

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SSAP 5.0 - Slope Stability Analysis Program (1991,2020)

WWW.SSAP.EU

Build No. 11716

BY

Dr. Geol. LORENZO BORSELLI \*,\*\*

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\*\* Gia' Ricercatore CNR-IRPI fino a Luglio 2011  
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Ultima Revisione struttura tabelle del report: 12 settembre 2020  
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File report: D:\ssp2010prove\lavori\smontemuro\versante\verifiche\progetto statico.txt

Data: 10/11/2020

Localita' : San Sebastiano - S.Maria a Monte

Descrizione: Verifica di stabilit  del pendio stato di progetto in condizioni statiche drenate

Modello pendio: PROGETTO.mod

----- PARAMETRI DEL MODELLO DEL PENDIO -----

\_\_\_ PARAMETRI GEOMETRICI - Coordinate X Y (in m) \_\_\_

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	0.00	82.55	21.17	41.28	12.09	23.18	5.00
3.60	0.00	82.25	21.17	113.48	12.09	113.48	5.11
8.62	1.00	82.25	17.17	-	-	-	-
15.21	3.00	82.55	17.17	-	-	-	-
23.18	5.00	82.55	21.17	-	-	-	-
27.66	7.00	-	-	-	-	-	-
29.20	9.00	-	-	-	-	-	-
38.23	11.00	-	-	-	-	-	-
41.28	12.09	-	-	-	-	-	-
43.84	13.00	-	-	-	-	-	-
47.59	15.00	-	-	-	-	-	-
49.82	17.00	-	-	-	-	-	-
56.39	19.00	-	-	-	-	-	-
64.37	21.00	-	-	-	-	-	-
82.25	21.17	-	-	-	-	-	-
82.55	21.17	-	-	-	-	-	-
82.55	17.17	-	-	-	-	-	-
94.55	17.17	-	-	-	-	-	-
113.48	17.17	-	-	-	-	-	-

## ASSENZA DI FALDA ##

----- PARAMETRI GEOMECCANICI -----

	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
STRATO 1	22.00	25.00	0.00	19.50	20.00	2.277	0.00	0.00	0.00	0.00
STRATO 2	0.00	0.00	1000.00	25.00	25.00	1000.000	0.00	0.00	0.00	0.00
STRATO 3	26.00	7.00	0.00	21.50	21.50	1.718	0.00	0.00	0.00	0.00
STRATO 4	30.00	7.00	0.00	20.00	20.00	2.091	0.00	0.00	0.00	0.00

LEGENDA: fi` \_\_\_\_\_ Angolo di attrito interno efficace(in gradi)  
 C` \_\_\_\_\_ Coesione efficace (in Kpa)  
 Cu \_\_\_\_\_ Resistenza al taglio Non drenata (in Kpa)  
 Gamm \_\_\_\_\_ Peso di volume terreno fuori falda (in KN/m^3)  
 Gamm\_sat \_\_\_\_\_ Peso di volume terreno immerso (in KN/m^3)  
 STR\_IDX \_\_\_\_\_ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)  
 ---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002)-  
 sigci \_\_\_\_\_ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)  
 GSI \_\_\_\_\_ Geological Strenght Index ammasso(adimensionale)  
 mi \_\_\_\_\_ Indice litologico ammasso(adimensionale)  
 D \_\_\_\_\_ Fattore di disturbo ammasso(adimensionale)

Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)  
 Uso CRITERIO DI ROTTURA Hoek et al.(2002,2006) - non-lineare - Generalizzato, secondo Lei et al.(2016)

----- SOVRACCARICHI PRESENTI -----

SOVRACCARICO N.1

Carico in X1 (Kpa): 100.00  
 Carico in X2 (Kpa): 100.00  
 Posizione carico da X1 m.: 94.5500  
     a X2 m.: 113.4800  
 Inclinazione carico (gradi): 90.00  
 Componenti distribuzione forza unitaria applicata:  
 #Orizzontale (per metro di proiezione Verticale) (kN/m): da 0.00 a 0.00  
 #Verticale (per metro di proiezione Orizzontale) (kN/m): da 100.00 a 100.00  
 ##Nota: la distribuzione del carico e delle forze unitarie puo' variare  
         in modo lineare tra gli estremi di coordinate X1 e X2

----- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM -----

\*\*\* PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI  
 METODO DI RICERCA: CONVEX RANDOM - Chen (1992)  
 FILTRAGGIO SUPERFICI : ATTIVATO  
 COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00  
 LUNGHEZZA MEDIA SEGMENTI (m): 4.5 (+/-) 50%  
 INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 2.27 25.70  
 LIVELLO MINIMO CONSIDERATO (Ymin): 0.00  
 INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 54.00 111.21

\*\*\* TOTALE SUPERFICI GENERATE : 10000

----- INFORMAZIONI PARAMETRI DI CALCOLO -----

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)  
 METODO DI ESPLOREAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : A (rapido)  
 COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0000  
 COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0000

COEFFICIENTE  $c=K_v/K_h$  UTILIZZATO : 0.5000  
FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00  
FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante le tutte le verifiche globali.  
I valori >0 impostati dall'utente sono utilizzati solo in caso di verifica singola

----- RISULTATO FINALE ELABORAZIONI -----

\* DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR  $F_s$  \*

Fattore di sicurezza (FS)	1.7980	- Min. -	X	Y	Lambda=	0.3574
			21.99	4.70		
			24.14	4.08		
			25.12	3.83		
			25.76	3.70		
			26.27	3.65		
			26.80	3.65		
			27.26	3.69		
			27.77	3.77		
			28.31	3.90		
			28.99	4.09		
			29.62	4.27		
			30.22	4.44		
			30.80	4.61		
			31.37	4.77		
			31.94	4.94		
			32.51	5.10		
			33.08	5.26		
			33.64	5.43		
			34.21	5.59		
			34.78	5.75		
			35.35	5.92		
			35.91	6.08		
			36.49	6.25		
			37.06	6.41		
			37.64	6.58		
			38.22	6.75		
			38.79	6.92		
			39.34	7.10		
			39.89	7.28		
			40.46	7.47		
			41.01	7.67		
			41.57	7.88		
			42.13	8.09		
			42.72	8.33		
			43.29	8.56		
			43.87	8.79		
			44.44	9.02		
			45.00	9.24		
			45.58	9.48		

46.16	9.71
46.75	9.95
47.36	10.20
47.92	10.45
48.46	10.70
48.99	10.98
49.54	11.28
50.07	11.60
50.63	11.96
51.22	12.36
51.88	12.82
52.46	13.26
53.01	13.71
53.53	14.17
54.09	14.69
54.68	15.29
55.36	16.02
56.35	17.15
58.36	19.49

Fattore di sicurezza (FS)    1.7981    - N.2 --    X    Y    Lambda= 0.3797

19.54	4.09
21.74	3.22
22.76	2.85
23.43	2.65
23.97	2.53
24.52	2.46
25.01	2.44
25.55	2.45
26.14	2.51
26.87	2.62
27.51	2.72
28.10	2.84
28.66	2.97
29.24	3.11
29.78	3.27
30.35	3.45
30.93	3.65
31.55	3.89
32.17	4.11
32.77	4.34
33.36	4.56
33.95	4.78
34.54	5.00
35.13	5.22
35.72	5.44
36.30	5.66
36.89	5.88
37.48	6.10
38.07	6.32
38.65	6.54
39.25	6.76

39.83	6.98
40.42	7.20
41.01	7.41
41.60	7.63
42.18	7.86
42.77	8.08
43.36	8.30
43.95	8.52
44.55	8.74
45.16	8.97
45.77	9.20
46.35	9.44
46.92	9.68
47.48	9.92
48.06	10.19
48.63	10.47
49.20	10.77
49.79	11.08
50.42	11.43
51.02	11.77
51.61	12.12
52.19	12.46
52.77	12.81
53.36	13.17
53.95	13.54
54.56	13.92
55.20	14.34
55.79	14.74
56.35	15.15
56.90	15.58
57.47	16.05
58.09	16.60
58.80	17.27
59.82	18.28
61.89	20.38

Fattore di sicurezza (FS)    1.7990 - N.3 --    X    Y    Lambda= 0.3823

19.55	4.09
22.63	2.48
23.99	1.83
24.84	1.49
25.47	1.33
26.17	1.26
26.73	1.27
27.39	1.38
28.15	1.58
29.15	1.90
30.06	2.20
30.89	2.48
31.70	2.75
32.48	3.02
33.25	3.30

34.02	3.58
34.81	3.87
35.60	4.17
36.39	4.47
37.18	4.76
37.96	5.06
38.75	5.36
39.54	5.65
40.33	5.95
41.13	6.26
41.93	6.56
42.71	6.86
43.48	7.18
44.24	7.50
45.01	7.84
45.78	8.18
46.55	8.55
47.35	8.94
48.18	9.35
48.97	9.76
49.75	10.18
50.51	10.60
51.28	11.04
52.04	11.50
52.82	11.98
53.63	12.49
54.49	13.05
55.28	13.58
56.04	14.13
56.78	14.70
57.55	15.31
58.38	16.02
59.33	16.87
60.69	18.15
63.43	20.77

Fattore di sicurezza (FS)    1.8045    - N.4 --

X	Y
21.83	4.66
23.97	3.87
24.93	3.55
25.56	3.38
26.05	3.30
26.57	3.27
27.00	3.29
27.50	3.36
28.04	3.48
28.72	3.67
29.35	3.84
29.94	4.00
30.51	4.16
31.07	4.32
31.62	4.49

Lambda= 0.3686

32.18	4.65
32.75	4.82
33.32	5.00
33.88	5.17
34.44	5.35
34.99	5.53
35.54	5.72
36.09	5.92
36.65	6.11
37.20	6.32
37.77	6.53
38.34	6.75
38.90	6.96
39.46	7.17
40.02	7.38
40.59	7.59
41.15	7.80
41.71	8.01
42.26	8.22
42.82	8.44
43.38	8.65
43.94	8.86
44.50	9.07
45.07	9.29
45.64	9.51
46.23	9.74
46.84	9.97
47.39	10.21
47.92	10.45
48.43	10.71
48.97	11.02
49.49	11.33
50.04	11.68
50.61	12.08
51.27	12.56
51.84	13.00
52.39	13.46
52.90	13.92
53.45	14.45
54.03	15.05
54.70	15.80
55.68	16.94
57.66	19.32

Fattore di sicurezza (FS)	1.8096	- N.5	--	X	Y	Lambda=	0.3901
				21.97	4.70		
				24.04	4.18		
				25.00	3.96		
				25.64	3.85		
				26.16	3.80		
				26.69	3.80		
				27.15	3.83		



27.66	3.89
28.20	4.00
28.85	4.15
29.46	4.29
30.04	4.43
30.61	4.57
31.16	4.71
31.72	4.84
32.28	4.98
32.84	5.12
33.40	5.25
33.96	5.39
34.52	5.53
35.07	5.68
35.62	5.82
36.18	5.97
36.73	6.12
37.29	6.27
37.85	6.43
38.41	6.59
38.97	6.75
39.53	6.90
40.08	7.06
40.64	7.22
41.20	7.38
41.75	7.55
42.31	7.71
42.87	7.88
43.43	8.04
43.99	8.21
44.54	8.37
45.11	8.54
45.68	8.70
46.25	8.87
46.84	9.05
47.39	9.22
47.93	9.40
48.45	9.60
49.00	9.81
49.53	10.04
50.08	10.28
50.66	10.55
51.28	10.86
51.85	11.16
52.39	11.46
52.91	11.78
53.46	12.13
53.98	12.48
54.53	12.88
55.10	13.31
55.73	13.81
56.30	14.28
56.84	14.76

57.37	15.24
57.92	15.77
58.51	16.38
59.18	17.11
60.16	18.20
62.11	20.43

Fattore di sicurezza (FS)    1.8097   - N.6 --    X    Y    Lambda= 0.3731

21.68	4.62
24.34	3.44
25.54	2.95
26.30	2.69
26.89	2.56
27.52	2.50
28.05	2.51
28.65	2.59
29.32	2.73
30.19	2.96
30.97	3.18
31.69	3.39
32.39	3.59
33.08	3.80
33.75	4.02
34.43	4.24
35.12	4.47
35.82	4.71
36.53	4.96
37.22	5.20
37.92	5.44
38.61	5.68
39.30	5.92
39.99	6.16
40.68	6.40
41.37	6.64
42.06	6.88
42.75	7.12
43.45	7.36
44.13	7.60
44.83	7.85
45.53	8.09
46.25	8.35
46.98	8.61
47.66	8.86
48.33	9.13
48.98	9.42
49.66	9.73
50.31	10.05
50.98	10.40
51.66	10.78
52.39	11.19
53.11	11.61
53.81	12.01

54.50	12.42
55.19	12.82
55.89	13.23
56.59	13.64
57.31	14.07
58.05	14.51
58.73	14.94
59.39	15.38
60.04	15.85
60.71	16.36
61.44	16.95
62.27	17.67
63.47	18.76
65.90	21.01

Fattore di sicurezza (FS)    1.8100   - N.7 --    X    Y    Lambda= 0.3581

19.47	4.07
22.70	3.33
24.19	3.03
25.17	2.89
25.96	2.84
26.77	2.87
27.48	2.95
28.26	3.09
29.10	3.30
30.12	3.60
31.06	3.88
31.96	4.15
32.83	4.43
33.69	4.70
34.54	4.97
35.40	5.26
36.26	5.55
37.13	5.84
38.00	6.14
38.86	6.44
39.73	6.74
40.58	7.04
41.45	7.35
42.33	7.66
43.23	7.98
44.15	8.31
45.00	8.64
45.82	8.99
46.63	9.35
47.47	9.76
48.28	10.18
49.13	10.65
50.01	11.17
50.99	11.77
51.87	12.35
52.71	12.93

53.52	13.53
54.36	14.18
55.27	14.94
56.31	15.86
57.81	17.25
60.84	20.11

Fattore di sicurezza (FS)    1.8107   - N.8   --    X    Y    Lambda= 0.3699

18.49	3.82
21.60	3.37
23.06	3.19
24.04	3.13
24.84	3.12
25.64	3.18
26.36	3.28
27.14	3.44
27.96	3.65
28.92	3.93
29.84	4.21
30.72	4.47
31.58	4.73
32.42	4.98
33.27	5.23
34.12	5.48
34.96	5.73
35.80	5.98
36.64	6.24
37.49	6.49
38.34	6.74
39.18	6.99
40.03	7.25
40.89	7.50
41.77	7.76
42.66	8.03
43.49	8.30
44.30	8.58
45.10	8.88
45.93	9.21
46.74	9.56
47.58	9.94
48.48	10.37
49.48	10.88
50.32	11.35
51.12	11.86
51.86	12.39
52.67	13.03
53.51	13.79
54.50	14.77
55.97	16.33
59.03	19.66

Fattore di sicurezza (FS)	1.8115	- N.9	--	X	Y	Lambda=	0.3763
				17.88	3.67		
				19.94	2.61		
				20.89	2.15		
				21.52	1.88		
				22.03	1.71		
				22.54	1.59		
				22.99	1.51		
				23.50	1.48		
				24.05	1.47		
				24.74	1.50		
				25.34	1.54		
				25.89	1.59		
				26.41	1.65		
				26.94	1.74		
				27.45	1.84		
				27.98	1.96		
				28.52	2.10		
				29.12	2.27		
				29.69	2.43		
				30.25	2.60		
				30.80	2.76		
				31.34	2.93		
				31.89	3.10		
				32.43	3.27		
				32.98	3.45		
				33.54	3.64		
				34.09	3.82		
				34.64	4.01		
				35.19	4.19		
				35.74	4.37		
				36.29	4.56		
				36.84	4.75		
				37.39	4.93		
				37.94	5.12		
				38.49	5.31		
				39.04	5.50		
				39.59	5.69		
				40.13	5.88		
				40.68	6.07		
				41.23	6.26		
				41.78	6.45		
				42.33	6.65		
				42.88	6.84		
				43.43	7.04		
				43.98	7.23		
				44.53	7.43		
				45.09	7.63		
				45.64	7.82		
				46.21	8.02		
				46.78	8.23		
				47.32	8.43		
				47.86	8.64		

48.38	8.86
48.92	9.10
49.45	9.35
49.99	9.61
50.55	9.90
51.15	10.21
51.71	10.52
52.25	10.84
52.78	11.16
53.32	11.50
53.85	11.85
54.39	12.23
54.97	12.65
55.60	13.12
56.15	13.56
56.67	14.02
57.17	14.50
57.70	15.05
58.26	15.69
58.92	16.50
59.88	17.75
61.84	20.37

Fattore di sicurezza (FS)    1.8125   - N.10   --    X            Y            Lambda= 0.3675

19.81	4.15
22.25	2.75
23.35	2.15
24.06	1.83
24.61	1.63
25.19	1.51
25.68	1.46
26.24	1.46
26.86	1.51
27.67	1.63
28.39	1.74
29.05	1.86
29.68	1.98
30.31	2.11
30.92	2.25
31.54	2.41
32.18	2.58
32.86	2.77
33.51	2.96
34.15	3.15
34.77	3.35
35.40	3.56
36.02	3.77
36.65	3.99
37.29	4.22
37.94	4.47
38.59	4.71
39.23	4.95

39.86	5.20
40.50	5.45
41.13	5.70
41.77	5.95
42.41	6.21
43.05	6.47
43.69	6.74
44.33	7.00
44.96	7.27
45.59	7.54
46.22	7.82
46.86	8.10
47.50	8.39
48.16	8.69
48.79	8.99
49.42	9.30
50.05	9.60
50.68	9.92
51.31	10.24
51.94	10.57
52.59	10.92
53.26	11.28
53.90	11.64
54.53	12.00
55.14	12.37
55.77	12.76
56.40	13.15
57.03	13.57
57.69	14.00
58.38	14.48
59.02	14.94
59.64	15.41
60.24	15.89
60.86	16.41
61.54	17.01
62.31	17.73
63.42	18.81
65.65	21.01

----- ANALISI DEFICIT DI RESISTENZA -----

# DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR FS \*

# Analisi Deficit in riferimento a FS(progetto) = 1.100

Sup N.	FS	FTR (kN/m)	FTA (kN/m)	Bilancio (kN/m)	ESITO
1	1.798	1832.6	1019.3	711.4	Surplus
2	1.798	2309.7	1284.5	896.8	Surplus
3	1.799	2831.7	1574.1	1100.2	Surplus
4	1.804	1860.6	1031.1	726.4	Surplus
5	1.810	2197.9	1214.5	861.9	Surplus
6	1.810	2777.1	1534.5	1089.1	Surplus
7	1.810	2230.6	1232.3	875.0	Surplus
8	1.811	2019.9	1115.5	792.8	Surplus

9	1.811	2880.6	1590.2	1131.4	Surplus
10	1.813	3162.1	1744.5	1243.1	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 711.4

Note: FTR --> Forza totale Resistente lungo la superficie di scivolamento

FTA --> Forza totale Agente lungo la superficie di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN per metro di LARGHEZZA rispetto al fronte della scarpata

TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi ' (°)	(c', Cu) (kPa)
21.993	0.338	-16.10	0.62	0.00	0.00	30.00	7.00
22.331	0.338	-16.10	1.85	0.00	0.00	30.00	7.00
22.669	0.338	-16.10	3.08	0.00	0.00	30.00	7.00
23.007	0.173	-16.10	2.05	0.00	0.00	30.00	7.00
23.180	0.338	-16.10	5.21	0.00	0.00	30.00	7.00
23.518	0.338	-16.10	6.96	0.00	0.00	30.00	7.00
23.856	0.285	-16.10	7.23	0.00	0.00	30.00	7.00
24.141	0.338	-14.58	10.16	0.00	0.00	30.00	7.00
24.479	0.338	-14.58	11.85	0.00	0.00	30.00	7.00
24.817	0.305	-14.58	12.13	0.00	0.00	30.00	7.00
25.121	0.338	-10.98	14.99	0.00	0.00	30.00	7.00
25.459	0.302	-10.98	14.70	0.00	0.00	30.00	7.00
25.761	0.338	-6.13	17.81	0.00	0.00	30.00	7.00
26.099	0.175	-6.13	9.74	0.00	0.00	30.00	7.00
26.274	0.338	-0.06	19.72	0.00	0.00	30.00	7.00
26.612	0.189	-0.06	11.53	0.00	0.00	30.00	7.00
26.801	0.338	4.68	21.34	0.00	0.00	30.00	7.00
27.139	0.120	4.68	7.81	0.00	0.00	30.00	7.00
27.260	0.338	9.47	22.48	0.00	0.00	30.00	7.00
27.598	0.062	9.47	4.23	0.00	0.00	30.00	7.00
27.660	0.106	9.47	7.32	0.00	0.00	30.00	7.00
27.766	0.338	13.29	25.17	0.00	0.00	30.00	7.00
28.104	0.209	13.29	16.91	0.00	0.00	30.00	7.00
28.313	0.338	15.99	29.40	0.00	0.00	30.00	7.00
28.651	0.335	15.99	31.62	0.00	0.00	30.00	7.00
28.986	0.214	16.00	21.56	0.00	0.00	30.00	7.00
29.200	0.338	16.00	34.73	0.00	0.00	30.00	7.00
29.538	0.079	16.00	8.11	0.00	0.00	30.00	7.00
29.617	0.338	16.00	34.59	0.00	0.00	30.00	7.00
29.955	0.261	16.00	26.61	0.00	0.00	30.00	7.00
30.216	0.338	16.00	34.40	0.00	0.00	30.00	7.00
30.554	0.248	16.00	25.12	0.00	0.00	30.00	7.00



30.801	0.338	16.00	34.20	0.00	0.00	30.00	7.00
31.139	0.229	16.00	23.10	0.00	0.00	30.00	7.00
31.368	0.338	16.00	34.02	0.00	0.00	30.00	7.00
31.706	0.232	16.00	23.32	0.00	0.00	30.00	7.00
31.938	0.254	16.00	25.44	0.00	0.00	30.00	7.00
32.192	0.314	16.00	31.37	0.00	0.00	26.00	7.00
32.507	0.338	16.01	33.57	0.00	0.00	26.00	7.00
32.845	0.231	16.01	22.88	0.00	0.00	26.00	7.00
33.076	0.338	16.01	33.30	0.00	0.00	26.00	7.00
33.414	0.227	16.01	22.26	0.00	0.00	26.00	7.00
33.641	0.338	16.03	33.03	0.00	0.00	26.00	7.00
33.979	0.231	16.03	22.46	0.00	0.00	26.00	7.00
34.209	0.338	16.05	32.76	0.00	0.00	26.00	7.00
34.547	0.230	16.05	22.19	0.00	0.00	26.00	7.00
34.777	0.338	16.08	32.48	0.00	0.00	26.00	7.00
35.115	0.232	16.08	22.18	0.00	0.00	26.00	7.00
35.347	0.338	16.10	32.21	0.00	0.00	26.00	7.00
35.685	0.229	16.10	21.70	0.00	0.00	26.00	7.00
35.914	0.338	16.12	31.93	0.00	0.00	26.00	7.00
36.251	0.234	16.12	22.04	0.00	0.00	26.00	7.00
36.486	0.338	16.15	31.65	0.00	0.00	26.00	7.00
36.824	0.235	16.15	21.92	0.00	0.00	26.00	7.00
37.059	0.338	16.17	31.37	0.00	0.00	26.00	7.00
37.397	0.241	16.17	22.29	0.00	0.00	26.00	7.00
37.638	0.338	16.19	31.08	0.00	0.00	26.00	7.00
37.976	0.245	16.19	22.44	0.00	0.00	26.00	7.00
38.221	0.009	16.86	0.81	0.00	0.00	26.00	7.00
38.230	0.338	16.86	30.93	0.00	0.00	26.00	7.00
38.568	0.217	16.86	19.96	0.00	0.00	26.00	7.00
38.785	0.338	17.56	31.13	0.00	0.00	26.00	7.00
39.123	0.220	17.56	20.31	0.00	0.00	26.00	7.00
39.343	0.338	18.27	31.28	0.00	0.00	26.00	7.00
39.681	0.214	18.27	19.83	0.00	0.00	26.00	7.00
39.895	0.338	18.98	31.38	0.00	0.00	26.00	7.00
40.233	0.223	18.98	20.76	0.00	0.00	26.00	7.00
40.456	0.338	19.68	31.41	0.00	0.00	26.00	7.00
40.794	0.214	19.68	19.92	0.00	0.00	26.00	7.00
41.009	0.271	20.37	25.22	0.00	0.00	26.00	7.00
41.280	0.287	20.37	26.60	0.00	0.00	26.00	7.00
41.567	0.338	21.04	31.21	0.00	0.00	26.00	7.00
41.905	0.227	21.04	20.88	0.00	0.00	26.00	7.00
42.132	0.338	21.68	30.93	0.00	0.00	26.00	7.00
42.470	0.246	21.68	22.39	0.00	0.00	26.00	7.00
42.716	0.338	21.74	30.61	0.00	0.00	26.00	7.00
43.054	0.241	21.74	21.71	0.00	0.00	26.00	7.00
43.294	0.338	21.79	30.29	0.00	0.00	26.00	7.00
43.632	0.208	21.79	18.51	0.00	0.00	26.00	7.00
43.840	0.027	21.79	2.40	0.00	0.00	26.00	7.00
43.867	0.338	21.85	30.20	0.00	0.00	26.00	7.00
44.205	0.233	21.85	20.97	0.00	0.00	26.00	7.00
44.438	0.338	21.91	30.54	0.00	0.00	26.00	7.00
44.776	0.228	21.91	20.76	0.00	0.00	26.00	7.00
45.005	0.338	21.98	30.87	0.00	0.00	26.00	7.00

45.343	0.237	21.98	21.76	0.00	0.00	26.00	7.00
45.580	0.338	22.04	31.21	0.00	0.00	26.00	7.00
45.917	0.242	22.04	22.45	0.00	0.00	26.00	7.00
46.159	0.338	22.10	31.54	0.00	0.00	26.00	7.00
46.497	0.256	22.10	24.03	0.00	0.00	26.00	7.00
46.753	0.338	22.15	31.87	0.00	0.00	26.00	7.00
47.091	0.273	22.15	25.91	0.00	0.00	26.00	7.00
47.365	0.225	23.75	21.44	0.00	0.00	26.00	7.00
47.590	0.332	23.75	32.05	0.00	0.00	26.00	7.00
47.922	0.338	25.52	33.50	0.00	0.00	26.00	7.00
48.260	0.205	25.52	20.69	0.00	0.00	26.00	7.00
48.464	0.338	27.38	34.78	0.00	0.00	26.00	7.00
48.802	0.187	27.38	19.52	0.00	0.00	26.00	7.00
48.989	0.338	29.15	35.86	0.00	0.00	26.00	7.00
49.327	0.215	29.15	23.11	0.00	0.00	26.00	7.00
49.542	0.278	30.92	30.28	0.00	0.00	26.00	7.00
49.820	0.255	30.92	27.65	0.00	0.00	26.00	7.00
50.075	0.338	32.61	35.96	0.00	0.00	26.00	7.00
50.413	0.219	32.61	22.82	0.00	0.00	26.00	7.00
50.632	0.193	34.09	19.75	0.00	0.00	26.00	7.00
50.824	0.338	34.09	33.96	0.00	0.00	22.00	25.00
51.162	0.057	34.09	5.60	0.00	0.00	22.00	25.00
51.219	0.338	35.32	32.95	0.00	0.00	22.00	25.00
51.557	0.320	35.32	30.41	0.00	0.00	22.00	25.00
51.877	0.338	37.08	31.15	0.00	0.00	22.00	25.00
52.215	0.241	37.08	21.60	0.00	0.00	22.00	25.00
52.456	0.338	39.09	29.36	0.00	0.00	22.00	25.00
52.794	0.214	39.09	18.00	0.00	0.00	22.00	25.00
53.008	0.338	41.18	27.45	0.00	0.00	22.00	25.00
53.346	0.188	41.18	14.71	0.00	0.00	22.00	25.00
53.534	0.338	43.14	25.40	0.00	0.00	22.00	25.00
53.872	0.215	43.14	15.40	0.00	0.00	22.00	25.00
54.086	0.338	45.48	23.01	0.00	0.00	22.00	25.00
54.424	0.252	45.48	16.09	0.00	0.00	22.00	25.00
54.676	0.338	47.23	20.17	0.00	0.00	22.00	25.00
55.014	0.338	47.23	18.44	0.00	0.00	22.00	25.00
55.352	0.006	47.23	0.33	0.00	0.00	22.00	25.00
55.358	0.338	48.68	16.61	0.00	0.00	22.00	25.00
55.696	0.338	48.68	14.76	0.00	0.00	22.00	25.00
56.034	0.314	48.68	12.07	0.00	0.00	22.00	25.00
56.348	0.042	49.37	1.48	0.00	0.00	22.00	25.00
56.390	0.338	49.37	10.85	0.00	0.00	22.00	25.00
56.728	0.338	49.37	8.81	0.00	0.00	22.00	25.00
57.066	0.338	49.37	6.77	0.00	0.00	22.00	25.00
57.404	0.338	49.37	4.74	0.00	0.00	22.00	25.00
57.742	0.338	49.37	2.70	0.00	0.00	22.00	25.00
58.080	0.278	49.37	0.69	0.00	0.00	22.00	25.00

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LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
dx(m) : Larghezza concio  
alpha (°) : Angolo pendenza base concio

W(kN/m) : Forza peso concio  
 ru(-) : Coefficiente locale pressione interstiziale  
 U(kPa) : Pressione totale dei pori base concio  
 phi'(°) : Angolo di attrito efficace base concio  
 c'/Cu (kPa) : Coesione efficace o Resistenza al taglio in condizioni non drenate

TABELLA DIAGRAMMA DELLE FORZE DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	ht (m)	yt (m)	yt' (--)	E (x) (kN/m)	T (x) (kN/m)	E' (kN)	rho (x) (--)	FS_qFEM (--)	FS_srmFEM (--)
21.993	0.000	4.702	-0.163	0.000000000E+000	0.000000000E+000	0.000000000E+000	0.060	7.992	4.190
22.331	0.046	4.650	-0.163	7.1613873033E-001	1.7418745414E-003	4.6128196928E+000	0.060	7.992	4.190
22.669	0.085	4.592	-0.144	3.1178551803E+000	5.8587493406E-002	8.3333829472E+000	0.060	5.666	2.921
23.007	0.144	4.553	-0.106	6.3487632250E+000	2.4283729717E-001	1.2531316033E+001	0.060	6.516	2.814
23.180	0.178	4.538	-0.075	8.7764179133E+000	4.5816790642E-001	1.5338297802E+001	0.086	7.692	2.844
23.518	0.252	4.515	-0.058	1.4811450653E+001	1.1667522395E+000	2.0296090282E+001	0.144	10.277	2.952
23.856	0.334	4.498	-0.037	2.2494766871E+001	2.3420219924E+000	2.4926672247E+001	0.206	10.516	3.079
24.141	0.409	4.492	-0.017	3.0121827350E+001	3.7434411316E+000	2.7441148542E+001	0.259	8.894	3.180
24.479	0.493	4.488	-0.003	3.9663079792E+001	5.6168744732E+000	2.9081831766E+001	0.309	7.343	3.271
24.817	0.583	4.490	0.021	4.9778554875E+001	7.7170949948E+000	3.1129329356E+001	0.349	6.211	3.351
25.121	0.674	4.501	0.054	5.9589392163E+001	9.9315809323E+000	3.2484771080E+001	0.385	5.354	3.408
25.459	0.763	4.525	0.094	7.0671189190E+001	1.2631159377E+001	3.2763473029E+001	0.423	4.627	3.442
25.761	0.858	4.561	0.135	8.0561530042E+001	1.5310538036E+001	3.0995713042E+001	0.457	4.096	3.428
26.099	0.944	4.611	0.158	9.0377561885E+001	1.8161283388E+001	2.6887603287E+001	0.490	3.691	3.384
26.274	0.994	4.642	0.193	9.4884978384E+001	1.9572295773E+001	2.4801792521E+001	0.505	3.530	3.347
26.612	1.062	4.710	0.210	1.0263404065E+002	2.2164888289E+001	2.1266565094E+001	0.534	3.293	3.260
26.801	1.105	4.753	0.261	1.0648388800E+002	2.3557623996E+001	1.9567310333E+001	0.550	3.187	3.204
27.139	1.172	4.848	0.282	1.1263354243E+002	2.6059226940E+001	1.6047236096E+001	0.579	3.022	3.077
27.260	1.197	4.882	0.350	1.1447017150E+002	2.6873015220E+001	1.5165896132E+001	0.589	2.974	3.032
27.598	1.267	5.008	0.375	1.1948435192E+002	2.9429558538E+001	1.3736000135E+001	0.622	2.833	2.874
27.660	1.280	5.032	0.411	1.2032936994E+002	2.9888043377E+001	1.3306117879E+001	0.628	2.810	2.845
27.766	1.308	5.077	0.458	1.2169463324E+002	3.0688755029E+001	1.2658028880E+001	0.635	2.769	2.794
28.104	1.386	5.235	0.480	1.2568610622E+002	3.3300107001E+001	1.1251391759E+001	0.659	2.646	2.624
28.313	1.441	5.340	0.523	1.2796773575E+002	3.4934570152E+001	1.0591233595E+001	0.673	2.575	2.523
28.651	1.526	5.522	0.545	1.3137573029E+002	3.7642980284E+001	9.7014907942E+000	0.699	2.469	2.366
28.986	1.615	5.706	0.545	1.3449658603E+002	4.0297511514E+001	8.8821662123E+000	0.722	2.377	2.226
29.200	1.668	5.821	0.526	1.3634088032E+002	4.1907700990E+001	8.5734883709E+000	0.735	2.326	2.149
29.538	1.747	5.997	0.508	1.3922414714E+002	4.4380773820E+001	7.7152070723E+000	0.770	2.256	2.044
29.617	1.760	6.032	0.462	1.3981920417E+002	4.4871416913E+001	7.6532035428E+000	0.777	2.243	2.024
29.955	1.820	6.190	0.416	1.4259197263E+002	4.7008111273E+001	7.5636634408E+000	0.806	2.191	1.949
30.216	1.837	6.281	0.341	1.4443474305E+002	4.8212917533E+001	7.0926312250E+000	0.822	2.161	1.914
30.554	1.852	6.393	0.311	1.4684193887E+002	4.9602342072E+001	6.8580179760E+000	0.840	2.126	1.882
30.801	1.851	6.464	0.283	1.4849160188E+002	5.0392978949E+001	6.7142720376E+000	0.849	2.104	1.871
31.139	1.850	6.559	0.280	1.5078389593E+002	5.1355989161E+001	6.7057214625E+000	0.859	2.074	1.867
31.368	1.848	6.622	0.273	1.5230666682E+002	5.1918648365E+001	6.4712453675E+000	0.865	2.053	1.870
31.706	1.842	6.713	0.267	1.5440270561E+002	5.2581041998E+001	5.8876887240E+000	0.871	2.023	1.884
31.938	1.836	6.775	0.260	1.5572040602E+002	5.2948382745E+001	5.3584197029E+000	0.875	2.002	1.899
32.192	1.829	6.840	0.253	1.5699469463E+002	5.3255887846E+001	4.7207579926E+000	0.877	1.977	1.725
32.507	1.817	6.918	0.252	1.5836362664E+002	5.3559090215E+001	4.1364482023E+000	0.878	1.954	1.751
32.845	1.806	7.004	0.255	1.5968199701E+002	5.3815942994E+001	3.6551732453E+000	0.878	1.935	1.782

33.076	1.799	7.063	0.255	1.6048840539E+002	5.3953915817E+001	3.3479265578E+000	0.878	1.926	1.804
33.414	1.788	7.149	0.255	1.6155120164E+002	5.4107145492E+001	2.9739154824E+000	0.878	1.917	1.837
33.641	1.781	7.207	0.255	1.6219972589E+002	5.4182600381E+001	2.7781136792E+000	0.878	1.915	1.859
33.979	1.770	7.293	0.255	1.6309775372E+002	5.4261385800E+001	2.5744650749E+000	0.877	1.916	1.892
34.209	1.762	7.352	0.250	1.6367883877E+002	5.4297133672E+001	2.4599428924E+000	0.876	1.920	1.913
34.547	1.748	7.436	0.249	1.6448148518E+002	5.4325210205E+001	2.3975882686E+000	0.874	1.929	1.943
34.777	1.740	7.493	0.253	1.6503624080E+002	5.4335413914E+001	2.4123382199E+000	0.873	1.935	1.963
35.115	1.728	7.579	0.253	1.6585119954E+002	5.4339157332E+001	2.3981067559E+000	0.871	1.943	1.991
35.347	1.720	7.637	0.253	1.6640469250E+002	5.4336886493E+001	2.3880665762E+000	0.870	1.948	2.010
35.685	1.708	7.723	0.253	1.6721130863E+002	5.4329166585E+001	2.3705893403E+000	0.868	1.955	2.037
35.914	1.700	7.781	0.267	1.6775098025E+002	5.4323150301E+001	2.4450418823E+000	0.867	1.960	2.054
36.251	1.696	7.875	0.276	1.6861993865E+002	5.4316350492E+001	2.5216644403E+000	0.865	1.967	2.080
36.486	1.692	7.939	0.272	1.6920269572E+002	5.4314441851E+001	2.4578658387E+000	0.863	1.971	2.097
36.824	1.686	8.031	0.269	1.7001899219E+002	5.4317757307E+001	2.3176245648E+000	0.862	1.977	2.119
37.059	1.681	8.093	0.266	1.7054787297E+002	5.4324932204E+001	2.1920581223E+000	0.861	1.981	2.133
37.397	1.673	8.183	0.264	1.7126073189E+002	5.4343118420E+001	1.9715468509E+000	0.860	1.985	2.151
37.638	1.666	8.246	0.263	1.7171267033E+002	5.4360665941E+001	1.7770970756E+000	0.859	1.987	2.161
37.976	1.657	8.335	0.264	1.7226776308E+002	5.4390141234E+001	1.4449913140E+000	0.859	1.989	2.174
38.221	1.651	8.400	0.264	1.7258689585E+002	5.4411266720E+001	1.0234504309E+000	0.859	1.989	2.181
38.230	1.650	8.402	0.276	1.7259584173E+002	5.4411944815E+001	1.0112782419E+000	0.859	1.989	2.181
38.568	1.641	8.496	0.282	1.7290974841E+002	5.4437840081E+001	7.0205814837E-001	0.857	1.988	2.189
38.785	1.639	8.559	0.305	1.7303061454E+002	5.4445996614E+001	3.8877386111E-001	0.856	1.988	2.193
39.123	1.638	8.665	0.316	1.7307397221E+002	5.4435887872E+001	-1.2655113161E-001	0.855	1.986	2.197
39.343	1.638	8.735	0.328	1.7300967544E+002	5.4411327579E+001	-4.8246280352E-001	0.855	1.985	2.199
39.681	1.639	8.848	0.340	1.7274790098E+002	5.4333924340E+001	-1.0988835045E+000	0.854	1.983	2.202
39.895	1.644	8.923	0.358	1.7246899224E+002	5.4249591532E+001	-1.5187920240E+000	0.853	1.982	2.203
40.233	1.650	9.046	0.368	1.7184106067E+002	5.4051912264E+001	-2.1886574658E+000	0.852	1.981	2.206
40.456	1.657	9.129	0.360	1.7130321279E+002	5.3872706349E+001	-2.5974380313E+000	0.851	1.981	2.208
40.794	1.655	9.248	0.352	1.7032816861E+002	5.3529072831E+001	-3.1972567915E+000	0.849	1.984	2.211
41.009	1.654	9.324	0.354	1.6960072975E+002	5.3261206540E+001	-3.5901237441E+000	0.848	1.986	2.214
41.280	1.649	9.420	0.358	1.6855905506E+002	5.2865524805E+001	-4.0448755532E+000	0.845	1.991	2.219
41.567	1.646	9.524	0.386	1.6733585383E+002	5.2391935417E+001	-4.7679659721E+000	0.831	1.998	2.226
41.905	1.654	9.661	0.405	1.6552396511E+002	5.1685300176E+001	-5.4952909346E+000	0.814	2.010	2.236
42.132	1.658	9.752	0.398	1.6425607627E+002	5.1193564371E+001	-5.6469325345E+000	0.803	2.020	2.243
42.470	1.657	9.886	0.394	1.6231664361E+002	5.0453855664E+001	-5.7769943216E+000	0.786	2.035	2.254
42.716	1.655	9.982	0.389	1.6088956010E+002	4.9924596633E+001	-5.8223104871E+000	0.774	2.046	2.261
43.054	1.652	10.113	0.383	1.5891375966E+002	4.9220894775E+001	-5.7774399869E+000	0.758	2.061	2.269
43.294	1.646	10.204	0.373	1.5753379816E+002	4.8754205083E+001	-5.6666657917E+000	0.748	2.071	2.272
43.632	1.636	10.328	0.370	1.5564795374E+002	4.8156020554E+001	-5.5859515279E+000	0.734	2.082	2.271
43.840	1.630	10.406	0.369	1.5448766220E+002	4.7810038670E+001	-5.0658267843E+000	0.725	2.088	2.267
43.867	1.629	10.415	0.383	1.5435292620E+002	4.7771734978E+001	-5.0499224512E+000	0.724	2.088	2.266
44.205	1.624	10.546	0.393	1.5242552301E+002	4.7245022137E+001	-5.7891300053E+000	0.703	2.094	2.251
44.438	1.624	10.639	0.414	1.5106098862E+002	4.6897010474E+001	-5.9620277130E+000	0.689	2.095	2.233
44.776	1.631	10.782	0.429	1.4899051512E+002	4.6399511060E+001	-6.2539687168E+000	0.670	2.092	2.198
45.005	1.639	10.882	0.452	1.4754217340E+002	4.6068367276E+001	-6.4792734305E+000	0.658	2.087	2.166
45.343	1.659	11.038	0.476	1.4528291041E+002	4.5571819484E+001	-6.9925270347E+000	0.641	2.073	2.107
45.580	1.680	11.155	0.502	1.4357487119E+002	4.5207274806E+001	-7.3027541991E+000	0.629	2.057	2.054
45.917	1.715	11.327	0.509	1.4106123771E+002	4.4680476584E+001	-7.5407666863E+000	0.612	2.027	1.972
46.159	1.740	11.450	0.504	1.3921987946E+002	4.4299789811E+001	-7.6339036177E+000	0.600	2.000	1.909
46.497	1.772	11.619	0.505	1.3663078107E+002	4.3769401780E+001	-7.9344555853E+000	0.584	1.953	1.817
46.753	1.799	11.750	0.528	1.3454506162E+002	4.3336984286E+001	-8.4938315705E+000	0.572	1.913	1.748
47.091	1.844	11.933	0.526	1.3151752762E+002	4.2694198612E+001	-9.4963017519E+000	0.556	1.850	1.655
47.365	1.872	12.072	0.495	1.2880355701E+002	4.2089898795E+001	-1.0444687298E+001	0.543	1.794	1.585

47.590	1.880	12.179	0.564	1.2635480773E+002	4.1526442679E+001	-1.1404948621E+001	0.532	1.747	1.530
47.922	1.941	12.386	0.634	1.2230828849E+002	4.0543553805E+001	-1.2742183900E+001	0.504	1.676	1.457
48.260	1.998	12.604	0.645	1.1781386745E+002	3.9400290025E+001	-1.4290637995E+001	0.476	1.607	1.393
48.464	2.032	12.736	0.660	1.1476579596E+002	3.8583863700E+001	-1.5644598574E+001	0.459	1.567	1.359
48.802	2.083	12.962	0.670	1.0905829885E+002	3.6987637106E+001	-1.7587755260E+001	0.430	1.509	1.311
48.989	2.112	13.087	0.666	1.0570285213E+002	3.6013350597E+001	-1.8742511632E+001	0.414	1.482	1.289
49.327	2.147	13.312	0.645	9.8898607927E+001	3.3956473009E+001	-2.0348537886E+001	0.383	1.448	1.256
49.542	2.160	13.444	0.600	9.4499500903E+001	3.2585321909E+001	-2.0627620820E+001	0.363	1.433	1.240
49.820	2.157	13.608	0.560	8.8709183229E+001	3.0734091531E+001	-2.0491667372E+001	0.337	1.423	1.223
50.075	2.139	13.743	0.530	8.3566056164E+001	2.9039671753E+001	-2.0643473977E+001	0.321	1.422	1.213
50.413	2.102	13.922	0.524	7.6389801156E+001	2.6602096354E+001	-2.1109768991E+001	0.298	1.431	1.204
50.632	2.074	14.034	0.505	7.1784857006E+001	2.4997831326E+001	-2.0856974292E+001	0.283	1.443	1.200
50.824	2.040	14.130	0.497	6.7797529690E+001	2.3569453036E+001	-2.0690194027E+001	0.269	1.461	1.639
51.162	1.979	14.298	0.497	6.0814325216E+001	2.1003169267E+001	-2.0580539714E+001	0.249	1.489	1.646
51.219	1.969	14.326	0.505	5.9651205530E+001	2.0569519250E+001	-2.0566261244E+001	0.245	1.493	1.647
51.557	1.900	14.497	0.516	5.2701662964E+001	1.7944006063E+001	-2.0667694207E+001	0.223	1.514	1.656
51.877	1.842	14.666	0.535	4.6048221036E+001	1.5426259820E+001	-2.0653386315E+001	0.200	1.527	1.662
52.215	1.770	14.849	0.549	3.9108614382E+001	1.2831429301E+001	-2.0346222984E+001	0.175	1.530	1.661
52.456	1.722	14.983	0.575	3.4237311101E+001	1.1056515736E+001	-2.0340375526E+001	0.156	1.522	1.654
52.794	1.646	15.182	0.589	2.7302451748E+001	8.6179475023E+000	-2.0079537195E+001	0.129	1.496	1.633
53.008	1.599	15.308	0.622	2.3067028543E+001	7.2003175563E+000	-1.9948420264E+001	0.112	1.468	1.611
53.346	1.520	15.525	0.644	1.6246491198E+001	5.1039970196E+000	-1.9678056819E+001	0.085	1.407	1.560
53.534	1.478	15.647	0.634	1.2601573612E+001	4.0649895061E+000	-1.8737049839E+001	0.070	1.369	1.526
53.872	1.372	15.858	0.625	6.6710348719E+000	2.5248220550E+000	-1.6891885329E+001	0.060	1.297	1.458
54.086	1.305	15.992	0.689	3.1352905898E+000	1.6782686968E+000	-1.6657100893E+001	0.060	1.250	1.413
54.424	1.208	16.239	0.734	-2.5909520727E+000	4.6946358058E-001	-1.6045536200E+001	0.060	1.168	1.331
54.676	1.138	16.425	0.729	-6.4585885446E+000	-2.5936550080E-001	-1.4461055714E+001	0.060	1.111	1.271
55.014	1.017	16.669	0.717	-1.0929844493E+001	-9.8769609145E-001	-1.1958047463E+001	0.060	1.041	1.197
55.352	0.892	16.909	0.710	-1.4541163349E+001	-1.4652679756E+000	-8.6177966261E+000	0.060	0.983	1.129
55.358	0.889	16.913	0.727	-1.4595364987E+001	-1.4710204879E+000	-8.5673165556E+000	0.060	0.982	1.128
55.696	0.751	17.160	0.730	-1.7277045657E+001	-1.7088433269E+000	-6.4212802110E+000	0.060	0.935	1.067
56.034	0.614	17.407	0.739	-1.8935578372E+001	-1.7537791172E+000	-4.9842332159E+000	0.070	0.891	1.009
56.348	0.492	17.642	0.758	-2.0525179459E+001	-1.7569104947E+000	-4.7803699546E+000	0.084	0.857	0.958
56.390	0.478	17.677	0.808	-2.0723079152E+001	-1.7477111818E+000	-4.3894973104E+000	0.086	0.853	0.952
56.728	0.356	17.949	0.849	-2.1236362525E+001	-1.5077861474E+000	5.6299336482E-001	0.094	0.834	0.895
57.066	0.264	18.251	0.981	-2.0342545791E+001	-1.0876984985E+000	5.7796807735E+000	0.092	0.845	0.842
57.404	0.231	18.612	0.989	-1.7329813203E+001	-5.0339266077E-001	1.0901979320E+001	0.061	0.891	0.786
57.742	0.144	18.919	0.919	-1.2973778971E+001	-1.6061085260E-001	1.5736575500E+001	0.060	1.027	0.854
58.080	0.064	19.233	0.919	-6.6932900551E+000	-3.8437011061E-002	2.1571720306E+001	0.060	2.860	2.884

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 LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
 ht(m) : Altezza linea di thrust da nodo sinistro base concio  
 yt(m) : coordinata Y linea di trust  
 yt'(-) : gradiente pendenza locale linea di trust  
 E(x) (kN/m) : Forza Normale interconcio  
 T(x) (kN/m) : Forza Tangenziale interconcio  
 E' (kN) : derivata Forza normale interconcio  
 Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio Zhu et al.(2003)  
 FS\_qFEM(x) (-) : fattore di sicurezza locale stimato (locale in X) by qFEM  
 FS\_srmFEM(x) (-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure

TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dl (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
21.993	0.338	0.352	-16.099	-0.486	-0.171	7.977	2.806
22.331	0.338	0.352	-16.099	-1.457	-0.513	10.086	3.548
22.669	0.338	0.352	-16.099	-2.429	-0.854	12.411	4.366
23.007	0.173	0.180	-16.099	-3.163	-0.569	14.589	2.624
23.180	0.338	0.352	-16.099	-4.104	-1.443	17.331	6.096
23.518	0.338	0.352	-16.099	-5.487	-1.930	21.496	7.561
23.856	0.285	0.296	-16.099	-6.763	-2.005	25.506	7.562
24.141	0.338	0.349	-14.583	-7.328	-2.559	28.688	10.018
24.479	0.338	0.349	-14.583	-8.546	-2.984	32.049	11.192
24.817	0.305	0.315	-14.583	-9.705	-3.055	35.654	11.222
25.121	0.338	0.344	-10.976	-8.292	-2.854	38.812	13.361
25.459	0.302	0.308	-10.976	-9.098	-2.800	41.998	12.924
25.761	0.338	0.340	-6.133	-5.598	-1.903	43.500	14.786
26.099	0.175	0.176	-6.133	-5.917	-1.041	44.939	7.905
26.274	0.338	0.338	-0.057	-0.058	-0.020	45.135	15.254
26.612	0.189	0.189	-0.057	-0.061	-0.011	46.416	8.788
26.801	0.338	0.339	4.677	5.131	1.740	46.379	15.726
27.139	0.120	0.121	4.677	5.279	0.637	47.156	5.686
27.260	0.338	0.343	9.475	10.798	3.700	46.398	15.897
27.598	0.062	0.063	9.475	11.002	0.696	47.042	2.978
27.660	0.106	0.107	9.475	11.244	1.204	47.945	5.135
27.766	0.338	0.347	13.286	16.656	5.784	48.844	16.961
28.104	0.209	0.215	13.286	18.075	3.886	52.327	11.249
28.313	0.338	0.352	15.994	23.042	8.101	53.872	18.940
28.651	0.335	0.348	15.994	25.019	8.713	57.849	20.146
28.986	0.214	0.223	15.995	26.635	5.942	61.074	13.625
29.200	0.338	0.352	15.995	27.221	9.570	62.245	21.883
29.538	0.079	0.082	15.995	27.168	2.235	62.073	5.107
29.617	0.338	0.352	15.997	27.116	9.533	61.970	21.787
29.955	0.261	0.271	15.997	27.039	7.332	61.718	16.736
30.216	0.338	0.352	15.999	26.964	9.480	61.532	21.633
30.554	0.248	0.258	15.999	26.889	6.924	61.327	15.793
30.801	0.338	0.352	16.000	26.816	9.428	61.154	21.500
31.139	0.229	0.238	16.000	26.743	6.367	60.984	14.520
31.368	0.338	0.352	16.002	26.672	9.377	60.807	21.379
31.706	0.232	0.242	16.002	26.598	6.429	60.637	14.656
31.938	0.254	0.264	16.004	26.538	7.013	60.489	15.986
32.192	0.314	0.327	16.004	26.446	8.647	51.948	16.986
32.507	0.338	0.352	16.005	26.327	9.256	51.746	18.193
32.845	0.231	0.241	16.005	26.221	6.309	51.570	12.407
33.076	0.338	0.352	16.007	26.118	9.183	51.392	18.069
33.414	0.227	0.236	16.007	26.012	6.138	51.216	12.085
33.641	0.338	0.352	16.030	25.940	9.121	51.029	17.943
33.979	0.231	0.240	16.030	25.833	6.203	50.850	12.210
34.209	0.338	0.352	16.053	25.759	9.059	50.660	17.815
34.547	0.230	0.239	16.053	25.652	6.137	50.478	12.076

34.777	0.338	0.352	16.076	25.576	8.995	50.286	17.686
35.115	0.232	0.241	16.076	25.468	6.141	50.103	12.081
35.347	0.338	0.352	16.099	25.391	8.931	49.909	17.555
35.685	0.229	0.238	16.099	25.282	6.018	49.725	11.837
35.914	0.338	0.352	16.122	25.205	8.867	49.530	17.424
36.251	0.234	0.244	16.122	25.094	6.120	49.342	12.034
36.486	0.338	0.352	16.145	25.015	8.801	49.144	17.291
36.824	0.235	0.245	16.145	24.903	6.095	48.955	11.982
37.059	0.338	0.352	16.168	24.822	8.734	48.755	17.156
37.397	0.241	0.251	16.168	24.708	6.207	48.563	12.199
37.638	0.338	0.352	16.191	24.624	8.666	48.361	17.019
37.976	0.245	0.255	16.191	24.509	6.257	48.166	12.296
38.221	0.009	0.009	16.861	25.353	0.234	47.796	0.441
38.230	0.338	0.353	16.861	25.406	8.972	47.880	16.908
38.568	0.217	0.227	16.861	25.496	5.789	48.027	10.905
38.785	0.338	0.354	17.560	26.499	9.393	47.845	16.960
39.123	0.220	0.231	17.560	26.570	6.129	47.960	11.062
39.343	0.338	0.356	18.274	27.562	9.809	47.730	16.987
39.681	0.214	0.225	18.274	27.610	6.219	47.817	10.770
39.895	0.338	0.357	18.979	28.551	10.204	47.560	16.997
40.233	0.223	0.236	18.979	28.576	6.752	47.620	11.251
40.456	0.338	0.359	19.678	29.472	10.578	47.335	16.989
40.794	0.214	0.228	19.678	29.471	6.706	47.366	10.778
41.009	0.271	0.290	20.375	30.323	8.781	47.052	13.626
41.280	0.287	0.306	20.375	30.260	9.259	47.001	14.382
41.567	0.338	0.362	21.044	30.946	11.206	46.601	16.875
41.905	0.227	0.243	21.044	30.819	7.496	46.454	11.299
42.132	0.338	0.364	21.676	31.419	11.426	45.983	16.723
42.470	0.246	0.265	21.676	31.257	8.269	45.777	12.110
42.716	0.338	0.364	21.735	31.162	11.337	45.536	16.567
43.054	0.241	0.259	21.735	30.998	8.039	45.307	11.750
43.294	0.338	0.364	21.795	30.901	11.247	45.044	16.395
43.632	0.208	0.224	21.795	30.745	6.873	44.833	10.023
43.840	0.027	0.029	21.795	30.693	0.891	44.721	1.298
43.867	0.338	0.364	21.855	30.873	11.242	44.856	16.333
44.205	0.233	0.251	21.855	31.048	7.805	45.056	11.326
44.438	0.338	0.364	21.915	31.291	11.399	45.234	16.478
44.776	0.228	0.246	21.915	31.462	7.747	45.438	11.188
45.005	0.338	0.364	21.976	31.703	11.554	45.617	16.625
45.343	0.237	0.256	21.976	31.875	8.145	45.839	11.713
45.580	0.338	0.365	22.036	32.115	11.709	46.019	16.778
45.917	0.242	0.261	22.036	32.286	8.423	46.229	12.060
46.159	0.338	0.365	22.096	32.525	11.863	46.402	16.925
46.497	0.256	0.276	22.096	32.698	9.041	46.634	12.894
46.753	0.338	0.365	22.153	32.937	12.018	46.856	17.097
47.091	0.273	0.295	22.153	33.113	9.770	47.132	13.906
47.365	0.225	0.246	23.751	35.075	8.634	46.513	11.450
47.590	0.332	0.363	23.751	35.605	12.907	47.218	17.117
47.922	0.338	0.375	25.525	38.548	14.436	47.395	17.750
48.260	0.205	0.227	25.525	39.310	8.917	48.356	10.968
48.464	0.338	0.381	27.385	42.029	15.996	48.224	18.354
48.802	0.187	0.210	27.385	42.709	8.979	49.038	10.310
48.989	0.338	0.387	29.152	45.135	17.466	48.858	18.907

49.327	0.215	0.246	29.152	45.781	11.257	49.540	12.182
49.542	0.278	0.324	30.919	47.980	15.560	48.956	15.877
49.820	0.255	0.297	30.919	47.873	14.209	48.869	14.505
50.075	0.338	0.401	32.606	48.297	19.376	47.216	18.942
50.413	0.219	0.260	32.606	47.309	12.298	46.516	12.092
50.632	0.193	0.233	34.094	47.598	11.068	45.005	10.466
50.824	0.338	0.408	34.094	46.643	19.035	57.073	23.292
51.162	0.057	0.068	34.094	45.978	3.140	56.718	3.873
51.219	0.338	0.414	35.316	45.995	19.050	55.730	23.082
51.557	0.320	0.393	35.316	44.772	17.580	55.084	21.629
51.877	0.338	0.424	37.081	44.333	18.780	53.366	22.607
52.215	0.241	0.302	37.081	43.108	13.023	52.521	15.866
52.456	0.338	0.435	39.092	42.521	18.515	50.739	22.093
52.794	0.214	0.276	39.092	41.183	11.350	49.699	13.697
53.008	0.338	0.449	41.178	40.245	18.070	47.695	21.416
53.346	0.188	0.250	41.178	38.796	9.685	46.580	11.629
53.534	0.338	0.463	43.138	37.499	17.368	44.277	20.506
53.872	0.215	0.294	43.138	35.799	10.529	43.125	12.684
54.086	0.338	0.482	45.478	34.034	16.404	41.028	19.774
54.424	0.252	0.359	45.478	31.987	11.474	39.739	14.255
54.676	0.338	0.498	47.229	29.749	14.805	37.648	18.737
55.014	0.338	0.498	47.229	27.197	13.536	36.168	18.000
55.352	0.006	0.009	47.229	25.898	0.241	35.326	0.329
55.358	0.338	0.512	48.677	24.378	12.477	34.163	17.485
55.696	0.338	0.512	48.677	21.656	11.084	32.788	16.782
56.034	0.314	0.476	48.677	19.029	9.061	31.767	15.127
56.348	0.042	0.064	49.374	17.528	1.123	30.917	1.981
56.390	0.338	0.519	49.374	15.865	8.235	29.990	15.566
56.728	0.338	0.519	49.374	12.885	6.688	28.575	14.831
57.066	0.338	0.519	49.374	9.905	5.141	27.193	14.114
57.404	0.338	0.519	49.374	6.926	3.595	26.673	13.844
57.742	0.338	0.519	49.374	3.946	2.048	26.108	13.551
58.080	0.278	0.428	49.374	1.228	0.525	25.327	10.832

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LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
dx(m) : Larghezza concio  
dl(m) : lunghezza base concio  
alpha(°) : Angolo pendenza base concio  
TauStress(kPa) : Sforzo di taglio su base concio  
TauF (kN/m) : Forza di taglio su base concio  
TauStrength(kPa) : Resistenza al taglio su base concio  
TauS (kN/m) : Forza resistente al taglio su base concio

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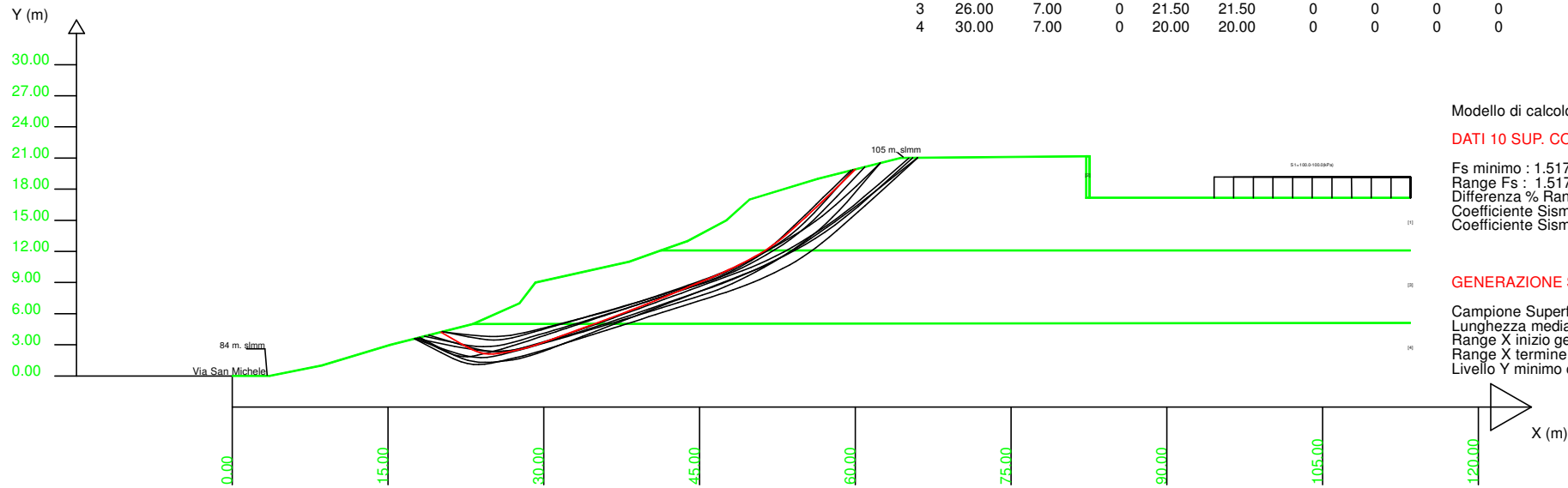
SSAP 5.0 (2020) - Slope Stability Analysis Program  
 Software by Dr.Geol. L.Borselli - www.lorenzo-borselli.eu  
 SSAP/DXF generator rel. 2.0 (2020)

Data : 10/11/2020  
 Località : San Sebastiano, S.Maria a Monte  
 Descrizione : Verifica di stabilità del pendio stato di progetto in condizioni sismiche drenate  
 [n] = N. strato o lente

Sn --> Sovraccarico

# Parametri Geotecnici degli strati #

N.	phi`	C`	Cu	Gamm	GammSat	sgci	GSI	mi	D
..	deg	kPa	kPa	kN/m3	kN/m3	MPa	..	..	..
1	22.00	25.00	0	19.50	20.00	0	0	0	0
2	0	0	1000.00	25.00	25.00	0	0	0	0
3	26.00	7.00	0	21.50	21.50	0	0	0	0
4	30.00	7.00	0	20.00	20.00	0	0	0	0



Modello di calcolo : Morgenstern - Price (1965)

DATI 10 SUP. CON MINOR Fs

Fs minimo : 1.5177  
 Range Fs : 1.5177 - 1.5306  
 Differenza % Range Fs : 0.85  
 Coefficiente Sismico orizzontale - Kh: 0.0610  
 Coefficiente Sismico verticale - Kv: 0.0305

GENERAZIONE SUPERFICI RANDOM

Campione Superfici - N.: 10000  
 Lunghezza media segmenti (m) : 4.5  
 Range X inizio generazione : 2.3 - 25.7  
 Range X termine generazione : 54.0 - 111.2  
 Livello Y minimo considerato : 0.0

# Report elaborazioni #

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SSAP 5.0 - Slope Stability Analysis Program (1991,2020)

WWW.SSAP.EU

Build No. 11716

BY

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\*\* Gia' Ricercatore CNR-IRPI fino a Luglio 2011

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Ultima Revisione struttura tabelle del report: 12 settembre 2020  
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File report: D:\ssp2010prove\lavori\smontemuro\versante\verifiche\progetto sismico.txt

Data: 10/11/2020

Localita' : San Sebastiano. S.Maria a Monte

Descrizione: Verifica di stabilit  del pendio stato di progetto in condizioni sismiche drenate

Modello pendio: PROGETTO.mod

----- PARAMETRI DEL MODELLO DEL PENDIO -----

\_\_\_ PARAMETRI GEOMETRICI - Coordinate X Y (in m) \_\_\_

SUP T.		SUP 2		SUP 3		SUP 4	
X	Y	X	Y	X	Y	X	Y
0.00	0.00	82.55	21.17	41.28	12.09	23.18	5.00
3.60	0.00	82.25	21.17	113.48	12.09	113.48	5.11
8.62	1.00	82.25	17.17	-	-	-	-
15.21	3.00	82.55	17.17	-	-	-	-
23.18	5.00	82.55	21.17	-	-	-	-
27.66	7.00	-	-	-	-	-	-
29.20	9.00	-	-	-	-	-	-
38.23	11.00	-	-	-	-	-	-
41.28	12.09	-	-	-	-	-	-
43.84	13.00	-	-	-	-	-	-
47.59	15.00	-	-	-	-	-	-
49.82	17.00	-	-	-	-	-	-
56.39	19.00	-	-	-	-	-	-
64.37	21.00	-	-	-	-	-	-
82.25	21.17	-	-	-	-	-	-
82.55	21.17	-	-	-	-	-	-
82.55	17.17	-	-	-	-	-	-

94.55 17.17 - - - - -  
 113.48 17.17 - - - - -  
 ## ASSENZA DI FALDA ##

----- PARAMETRI GEOMECCANICI -----

	fi`	C`	Cu	Gamm	Gamm_sat	STR_IDX	sgci	GSI	mi	D
STRATO 1	22.00	25.00	0.00	19.50	20.00	2.277	0.00	0.00	0.00	0.00
STRATO 2	0.00	0.00	1000.00	25.00	25.00	1000.000	0.00	0.00	0.00	0.00
STRATO 3	26.00	7.00	0.00	21.50	21.50	1.718	0.00	0.00	0.00	0.00
STRATO 4	30.00	7.00	0.00	20.00	20.00	2.091	0.00	0.00	0.00	0.00

LEGENDA: fi` \_\_\_\_\_ Angolo di attrito interno efficace (in gradi)  
 C` \_\_\_\_\_ Coesione efficace (in Kpa)  
 Cu \_\_\_\_\_ Resistenza al taglio Non drenata (in Kpa)  
 Gamm \_\_\_\_\_ Peso di volume terreno fuori falda (in KN/m^3)  
 Gamm\_sat \_\_\_\_\_ Peso di volume terreno immerso (in KN/m^3)  
 STR\_IDX \_\_\_\_\_ Indice di resistenza (usato in solo in 'SNIFF SEARCH) (adimensionale)  
 ---- SOLO Per AMMASSI ROCCIOSI FRATTURATI - Parametri Criterio di Rottura di Hoek (2002) -  
 sigci \_\_\_\_\_ Resistenza Compressione Uniassiale Roccia Intatta (in MPa)  
 GSI \_\_\_\_\_ Geological Strenght Index ammasso (adimensionale)  
 mi \_\_\_\_\_ Indice litologico ammasso (adimensionale)  
 D \_\_\_\_\_ Fattore di disturbo ammasso (adimensionale)  
 Fattore di riduzione NTC2018: gammaPHI=1.25 e gammaC=1.25 - DISATTIVATO (solo per ROCCE)  
 Uso CRITERIO DI ROTTURA Hoek et al. (2002,2006) - non-lineare - Generalizzato, secondo Lei et al. (2016)

----- SOVRACCARICHI PRESENTI -----

SOVRACCARICO N.1

Carico in X1 (Kpa): 100.00  
 Carico in X2 (Kpa): 100.00  
 Posizione carico da X1 m.: 94.5500  
 a X2 m.: 113.4800  
 Inclinazione carico (gradi): 90.00  
 Componenti distribuzione forza unitaria applicata:  
 #Orizzontale (per metro di proiezione Verticale) (kN/m): da 0.00 a 0.00  
 #Verticale (per metro di proiezione Orizzontale) (kN/m): da 100.00 a 100.00  
 ##Nota: la distribuzione del carico e delle forze unitarie puo' variare  
 in modo lineare tra gli estremi di coordinate X1 e X2

----- INFORMAZIONI GENERAZIONE SUPERFICI RANDOM -----

\*\*\* PARAMETRI PER LA GENERAZIONE DELLE SUPERFICI  
 METODO DI RICERCA: CONVEX RANDOM - Chen (1992)  
 FILTRAGGIO SUPERFICI : ATTIVATO  
 COORDINATE X1,X2,Y OSTACOLO : 0.00 0.00 0.00

LUNGHEZZA MEDIA SEGMENTI (m): 4.5 (+/-) 50%  
INTERVALLO ASCISSE RANDOM STARTING POINT (Xmin .. Xmax): 2.27 25.70  
LIVELLO MINIMO CONSIDERATO (Ymin): 0.00  
INTERVALLO ASCISSE AMMESSO PER LA TERMINAZIONE (Xmin .. Xmax): 54.00 111.21

\*\*\* TOTALE SUPERFICI GENERATE : 10000

----- INFORMAZIONI PARAMETRI DI CALCOLO -----

METODO DI CALCOLO : MORGENSTERN - PRICE (Morgenstern & Price, 1965)  
METODO DI ESPLORAZIONE CAMPO VALORI (lambda0,Fs0) ADOTTATO : A (rapido)  
COEFFICIENTE SISMICO UTILIZZATO Kh : 0.0610  
COEFFICIENTE SISMICO UTILIZZATO Kv (assunto Positivo): 0.0305  
COEFFICIENTE c=Kv/Kh UTILIZZATO : 0.5000  
FORZA ORIZZONTALE ADDIZIONALE IN TESTA (kN/m): 0.00  
FORZA ORIZZONTALE ADDIZIONALE ALLA BASE (kN/m): 0.00

N.B. Le forze orizzontali addizionali in testa e alla base sono poste uguali a 0 durante le tutte le verifiche globali.  
I valori >0 impostati dall'utente sono utilizzati solo in caso di verifica singola

----- RISULTATO FINALE ELABORAZIONI -----

\* DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*

Fattore di sicurezza (FS)	1.5177	- Min. -	X	Y	Lambda=	0.4872
			20.09	4.22		
			22.01	3.12		
			22.87	2.65		
			23.43	2.40		
			23.86	2.25		
			24.31	2.15		
			24.69	2.11		
			25.13	2.12		
			25.62	2.17		
			26.27	2.27		
			26.83	2.37		
			27.34	2.47		
			27.83	2.58		
			28.31	2.71		
			28.78	2.84		
			29.26	2.99		
			29.75	3.16		
			30.28	3.35		
			30.80	3.53		
			31.31	3.72		
			31.81	3.90		

32.31	4.08
32.81	4.26
33.31	4.45
33.81	4.63
34.31	4.81
34.81	4.99
35.31	5.17
35.80	5.36
36.30	5.54
36.80	5.73
37.30	5.91
37.80	6.10
38.30	6.30
38.80	6.49
39.30	6.68
39.80	6.88
40.29	7.07
40.79	7.27
41.28	7.47
41.78	7.68
42.28	7.88
42.79	8.09
43.29	8.30
43.79	8.51
44.28	8.71
44.79	8.92
45.29	9.13
45.80	9.34
46.31	9.56
46.80	9.77
47.29	9.99
47.78	10.21
48.27	10.45
48.76	10.69
49.26	10.94
49.78	11.21
50.34	11.51
50.83	11.79
51.31	12.09
51.77	12.40
52.26	12.74
52.72	13.10
53.20	13.49
53.69	13.91
54.23	14.40
54.75	14.87
55.26	15.34

55.76	15.80
56.26	16.27
56.81	16.80
57.43	17.39
58.30	18.24
60.00	19.90

Fattore di sicurezza (FS)    1.5226    - N.2 --    X    Y    Lambda=    0.4891

18.49	3.82
21.32	3.21
22.62	2.96
23.49	2.85
24.19	2.81
24.90	2.84
25.53	2.90
26.21	3.03
26.95	3.21
27.83	3.47
28.66	3.71
29.45	3.94
30.23	4.17
30.98	4.40
31.74	4.62
32.50	4.85
33.26	5.08
34.02	5.31
34.77	5.54
35.53	5.77
36.29	6.01
37.04	6.24
37.80	6.48
38.55	6.72
39.31	6.96
40.07	7.21
40.83	7.45
41.59	7.70
42.35	7.94
43.10	8.19
43.86	8.44
44.64	8.70
45.42	8.96
46.24	9.23
46.98	9.51
47.71	9.79
48.41	10.10
49.15	10.44

49.86	10.80
50.61	11.20
51.40	11.65
52.28	12.17
53.05	12.67
53.78	13.18
54.47	13.71
55.20	14.32
55.98	15.02
56.88	15.91
58.20	17.27
60.90	20.13

Fattore di sicurezza (FS)    1.5234    - N.3    --    X    Y    Lambda=    0.4890

20.24	4.26
22.69	3.77
23.82	3.58
24.58	3.49
25.19	3.46
25.81	3.49
26.37	3.55
26.96	3.66
27.60	3.82
28.36	4.03
29.08	4.24
29.77	4.44
30.45	4.64
31.10	4.82
31.77	5.02
32.42	5.20
33.08	5.39
33.74	5.58
34.40	5.77
35.06	5.96
35.72	6.15
36.37	6.34
37.04	6.53
37.70	6.72
38.36	6.92
39.02	7.11
39.68	7.30
40.33	7.49
40.99	7.69
41.64	7.89
42.30	8.10
42.96	8.31

43.64	8.53
44.33	8.76
44.99	8.99
45.63	9.23
46.26	9.47
46.91	9.74
47.54	10.02
48.18	10.32
48.85	10.64
49.56	11.00
50.23	11.34
50.88	11.69
51.53	12.05
52.18	12.41
52.83	12.79
53.49	13.18
54.17	13.60
54.89	14.05
55.55	14.48
56.18	14.93
56.80	15.39
57.44	15.90
58.14	16.49
58.93	17.21
60.08	18.28
62.39	20.50

Fattore di sicurezza (FS)    1.5257    - N.4    --

X	Y
17.55	3.59
20.43	2.56
21.74	2.13
22.58	1.91
23.25	1.80
23.95	1.77
24.55	1.79
25.22	1.89
25.95	2.04
26.86	2.28
27.71	2.51
28.50	2.73
29.28	2.94
30.03	3.15
30.78	3.36
31.54	3.58
32.29	3.80
33.05	4.03

Lambda= 0.4794



33.82	4.26
34.57	4.48
35.33	4.71
36.09	4.94
36.84	5.17
37.60	5.40
38.36	5.63
39.11	5.86
39.87	6.10
40.63	6.33
41.38	6.57
42.14	6.80
42.90	7.04
43.67	7.28
44.46	7.53
45.27	7.78
46.01	8.04
46.74	8.31
47.44	8.59
48.18	8.91
48.90	9.24
49.63	9.61
50.39	10.01
51.22	10.47
52.00	10.91
52.76	11.35
53.49	11.80
54.24	12.27
54.98	12.74
55.72	13.24
56.48	13.76
57.27	14.32
58.04	14.87
58.80	15.42
59.55	15.97
60.30	16.53
61.13	17.18
62.07	17.91
63.39	18.95
65.98	21.02

Fattore di sicurezza (FS)    1.5290    - N.5 --

X	Y
18.05	3.71
20.37	2.51
21.44	1.99
22.14	1.69

Lambda= 0.4744

22.69	1.51
23.27	1.39
23.77	1.32
24.33	1.30
24.95	1.32
25.75	1.39
26.42	1.47
27.04	1.56
27.61	1.67
28.21	1.81
28.76	1.96
29.35	2.15
29.95	2.36
30.62	2.62
31.27	2.87
31.91	3.11
32.53	3.35
33.15	3.59
33.77	3.82
34.38	4.06
35.00	4.30
35.61	4.54
36.23	4.77
36.84	5.01
37.46	5.25
38.08	5.48
38.70	5.72
39.31	5.96
39.93	6.20
40.54	6.43
41.16	6.67
41.77	6.91
42.39	7.15
43.01	7.38
43.63	7.62
44.24	7.86
44.86	8.10
45.47	8.33
46.09	8.57
46.71	8.81
47.32	9.05
47.94	9.28
48.57	9.52
49.20	9.77
49.85	10.02
50.52	10.28
51.12	10.53

51.70	10.80
52.26	11.09
52.86	11.43
53.43	11.78
54.02	12.18
54.66	12.63
55.37	13.16
56.01	13.66
56.61	14.17
57.19	14.69
57.79	15.27
58.44	15.93
59.18	16.74
60.25	17.97
62.42	20.51

Fattore di sicurezza (FS)      1.5297   - N.6 --      X      Y      Lambda=   0.4915

17.54	3.58
20.14	2.23
21.31	1.67
22.05	1.37
22.62	1.20
23.23	1.11
23.74	1.09
24.32	1.13
24.98	1.23
25.83	1.42
26.60	1.59
27.30	1.76
27.98	1.93
28.64	2.11
29.30	2.29
29.96	2.48
30.63	2.69
31.32	2.91
32.00	3.12
32.68	3.34
33.36	3.55
34.03	3.77
34.71	3.98
35.38	4.20
36.05	4.41
36.72	4.62
37.40	4.84
38.07	5.05
38.75	5.26

39.42	5.48
40.09	5.69
40.77	5.91
41.44	6.12
42.11	6.33
42.78	6.55
43.46	6.76
44.13	6.97
44.80	7.19
45.48	7.40
46.17	7.62
46.86	7.84
47.56	8.06
48.23	8.29
48.88	8.52
49.52	8.77
50.18	9.04
50.83	9.31
51.50	9.62
52.20	9.95
52.97	10.32
53.64	10.68
54.29	11.06
54.91	11.44
55.56	11.89
56.18	12.34
56.83	12.84
57.49	13.39
58.22	14.02
58.93	14.63
59.61	15.23
60.29	15.83
60.96	16.42
61.71	17.10
62.55	17.86
63.73	18.93
66.01	21.02

Fattore di sicurezza (FS)	1.5299	- N.7 --	X	Y	Lambda= 0.4811
			17.68	3.62	
			21.40	2.85	
			23.12	2.54	
			24.26	2.40	
			25.19	2.36	
			26.12	2.39	
			26.96	2.49	

27.87	2.65
28.84	2.89
30.01	3.22
31.10	3.54
32.13	3.85
33.14	4.15
34.13	4.46
35.11	4.78
36.10	5.10
37.10	5.43
38.10	5.77
39.11	6.11
40.11	6.45
41.11	6.79
42.10	7.13
43.11	7.48
44.11	7.82
45.14	8.18
46.18	8.54
47.17	8.91
48.14	9.28
49.09	9.68
50.07	10.10
51.03	10.54
52.03	11.01
53.06	11.53
54.19	12.12
55.19	12.67
56.15	13.25
57.06	13.85
58.03	14.54
59.06	15.34
60.26	16.32
61.99	17.84
65.53	21.01

Fattore di sicurezza (FS)      1.5301    - N.8 --

X	Y
17.85	3.66
19.87	2.67
20.78	2.25
21.35	2.03
21.79	1.91
22.26	1.85
22.66	1.85
23.11	1.89
23.61	1.99

Lambda= 0.4660

24.27	2.15
24.87	2.30
25.41	2.44
25.94	2.59
26.46	2.73
26.96	2.89
27.48	3.04
28.00	3.21
28.53	3.39
29.06	3.56
29.58	3.74
30.11	3.91
30.63	4.08
31.15	4.26
31.67	4.43
32.20	4.60
32.71	4.77
33.24	4.95
33.76	5.12
34.28	5.29
34.80	5.46
35.32	5.64
35.84	5.81
36.37	5.98
36.88	6.16
37.41	6.33
37.93	6.50
38.45	6.68
38.97	6.85
39.49	7.02
40.02	7.19
40.54	7.37
41.06	7.54
41.58	7.71
42.10	7.89
42.62	8.06
43.14	8.23
43.67	8.41
44.20	8.58
44.74	8.76
45.29	8.94
45.80	9.13
46.31	9.32
46.80	9.52
47.31	9.74
47.81	9.97
48.33	10.23

48.87	10.50
49.47	10.82
49.99	11.13
50.49	11.44
50.97	11.77
51.48	12.14
51.95	12.53
52.45	12.95
52.97	13.41
53.53	13.94
54.08	14.46
54.61	14.97
55.14	15.48
55.66	15.98
56.24	16.54
56.89	17.17
57.81	18.07
59.57	19.80

Fattore di sicurezza (FS)      1.5303   - N.9 --      X      Y      Lambda=   0.4826

18.91	3.93
22.04	3.00
23.47	2.62
24.39	2.43
25.13	2.35
25.90	2.35
26.56	2.41
27.30	2.54
28.10	2.73
29.11	3.03
30.02	3.30
30.88	3.57
31.71	3.84
32.53	4.11
33.34	4.38
34.16	4.67
34.98	4.96
35.82	5.27
36.66	5.57
37.49	5.88
38.32	6.18
39.14	6.48
39.97	6.78
40.80	7.08
41.62	7.39
42.44	7.69

43.27	7.99
44.10	8.29
44.92	8.59
45.75	8.89
46.58	9.20
47.43	9.51
48.29	9.82
49.16	10.14
49.97	10.46
50.77	10.80
51.54	11.15
52.34	11.55
53.12	11.96
53.93	12.41
54.77	12.90
55.69	13.47
56.54	14.02
57.35	14.57
58.14	15.13
58.95	15.73
59.83	16.43
60.84	17.26
62.28	18.49
65.15	21.01

Fattore di sicurezza (FS)	1.5306	- N.10 --	X	Y	Lambda=	0.4810
			20.17	4.25		
			22.74	3.95		
			23.96	3.84		
			24.79	3.80		
			25.49	3.80		
			26.17	3.84		
			26.80	3.91		
			27.46	4.02		
			28.15	4.17		
			28.94	4.36		
			29.69	4.55		
			30.42	4.73		
			31.14	4.91		
			31.85	5.09		
			32.56	5.27		
			33.27	5.45		
			33.98	5.64		
			34.70	5.83		
			35.41	6.02		
			36.11	6.21		



36.81	6.41
37.51	6.62
38.20	6.83
38.90	7.05
39.61	7.28
40.33	7.52
41.05	7.76
41.76	8.00
42.46	8.24
43.17	8.49
43.88	8.74
44.59	8.99
45.32	9.25
46.07	9.52
46.77	9.79
47.46	10.07
48.13	10.37
48.82	10.69
49.51	11.02
50.21	11.38
50.96	11.79
51.78	12.25
52.49	12.69
53.16	13.14
53.79	13.62
54.47	14.19
55.19	14.86
56.03	15.71
57.26	17.04
59.80	19.85

----- ANALISI DEFICIT DI RESISTENZA -----  
# DATI RELATIVI ALLE 10 SUPERFICI GENERATE CON MINOR Fs \*  
# Analisi Deficit in riferimento a FS(progetto) = 1.100

Sup N.	FS	FTR (kN/m)	FTA (kN/m)	Bilancio (kN/m)	ESITO
1	1.518	2235.9	1473.2	615.3	Surplus
2	1.523	2206.8	1449.4	612.5	Surplus
3	1.523	2099.3	1378.0	583.4	Surplus
4	1.526	2932.0	1921.8	818.1	Surplus
5	1.529	2844.3	1860.2	798.0	Surplus
6	1.530	3277.9	2142.8	920.8	Surplus
7	1.530	2813.7	1839.1	790.7	Surplus
8	1.530	2204.1	1440.5	619.5	Surplus
9	1.530	2641.3	1726.0	742.7	Surplus
10	1.531	1942.1	1268.8	546.4	Surplus

Esito analisi: SURPLUS di RESISTENZA!

Valore minimo di SURPLUS di RESISTENZA (kN/m): 546.4

Note: FTR --> Forza totale Resistente lungo la superficie  
di scivolamento

FTA --> Forza totale Agente lungo la superficie  
di scivolamento

IMPORTANTE! : Il Deficit o il Surplus di resistenza viene espresso in kN  
per metro di LARGHEZZA rispetto al fronte della scarpata

TABELLA PARAMETRI CONCI DELLA SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	alpha (°)	W (kN/m)	ru (-)	U (kPa)	phi ' (°)	(c', Cu) (kPa)
20.088	0.359	-29.92	1.10	0.00	0.00	30.00	7.00
20.448	0.359	-29.92	3.30	0.00	0.00	30.00	7.00
20.807	0.359	-29.92	5.49	0.00	0.00	30.00	7.00
21.166	0.359	-29.92	7.69	0.00	0.00	30.00	7.00
21.525	0.359	-29.92	9.89	0.00	0.00	30.00	7.00
21.884	0.124	-29.92	3.92	0.00	0.00	30.00	7.00
22.008	0.359	-28.46	12.80	0.00	0.00	30.00	7.00
22.368	0.359	-28.46	14.91	0.00	0.00	30.00	7.00
22.727	0.147	-28.46	6.71	0.00	0.00	30.00	7.00
22.874	0.306	-24.74	15.04	0.00	0.00	30.00	7.00
23.180	0.246	-24.74	13.19	0.00	0.00	30.00	7.00
23.426	0.359	-19.26	21.25	0.00	0.00	30.00	7.00
23.785	0.071	-19.26	4.49	0.00	0.00	30.00	7.00
23.856	0.359	-11.87	23.71	0.00	0.00	30.00	7.00
24.215	0.094	-11.87	6.47	0.00	0.00	30.00	7.00
24.309	0.359	-5.69	25.87	0.00	0.00	30.00	7.00
24.668	0.022	-5.69	1.61	0.00	0.00	30.00	7.00
24.690	0.359	0.72	27.36	0.00	0.00	30.00	7.00
25.049	0.080	0.72	6.22	0.00	0.00	30.00	7.00
25.128	0.359	5.64	28.76	0.00	0.00	30.00	7.00
25.488	0.135	5.64	11.06	0.00	0.00	30.00	7.00
25.622	0.359	8.81	30.08	0.00	0.00	30.00	7.00
25.982	0.292	8.81	25.11	0.00	0.00	30.00	7.00
26.274	0.359	9.95	31.62	0.00	0.00	30.00	7.00
26.633	0.199	9.95	17.90	0.00	0.00	30.00	7.00
26.832	0.359	11.36	32.84	0.00	0.00	30.00	7.00
27.192	0.153	11.36	14.17	0.00	0.00	30.00	7.00
27.344	0.316	12.90	29.75	0.00	0.00	30.00	7.00

27.660	0.166	12.90	16.12	0.00	0.00	30.00	7.00
27.826	0.359	14.50	37.06	0.00	0.00	30.00	7.00
28.185	0.128	14.50	13.99	0.00	0.00	30.00	7.00
28.314	0.359	15.95	41.13	0.00	0.00	30.00	7.00
28.673	0.109	15.95	13.06	0.00	0.00	30.00	7.00
28.782	0.359	17.39	44.94	0.00	0.00	30.00	7.00
29.141	0.059	17.39	7.65	0.00	0.00	30.00	7.00
29.200	0.062	17.39	8.15	0.00	0.00	30.00	7.00
29.262	0.359	18.72	46.69	0.00	0.00	30.00	7.00
29.622	0.132	18.72	17.14	0.00	0.00	30.00	7.00
29.754	0.359	19.91	46.29	0.00	0.00	30.00	7.00
30.113	0.168	19.91	21.58	0.00	0.00	30.00	7.00
30.282	0.359	19.91	45.80	0.00	0.00	30.00	7.00
30.641	0.159	19.91	20.15	0.00	0.00	30.00	7.00
30.800	0.359	19.92	45.33	0.00	0.00	30.00	7.00
31.159	0.149	19.92	18.69	0.00	0.00	30.00	7.00
31.308	0.359	19.92	44.86	0.00	0.00	30.00	7.00
31.667	0.146	19.92	18.15	0.00	0.00	30.00	7.00
31.813	0.359	19.92	44.39	0.00	0.00	30.00	7.00
32.172	0.138	19.92	17.03	0.00	0.00	30.00	7.00
32.311	0.359	19.93	43.94	0.00	0.00	30.00	7.00
32.670	0.142	19.93	17.25	0.00	0.00	30.00	7.00
32.811	0.359	19.93	43.47	0.00	0.00	30.00	7.00
33.171	0.140	19.93	16.90	0.00	0.00	30.00	7.00
33.311	0.359	19.94	43.01	0.00	0.00	30.00	7.00
33.670	0.142	19.94	16.89	0.00	0.00	30.00	7.00
33.812	0.359	19.94	42.55	0.00	0.00	30.00	7.00
34.171	0.139	19.94	16.36	0.00	0.00	30.00	7.00
34.310	0.359	20.05	42.09	0.00	0.00	30.00	7.00
34.669	0.140	20.05	16.27	0.00	0.00	30.00	7.00
34.809	0.067	20.16	7.83	0.00	0.00	30.00	7.00
34.876	0.359	20.16	41.51	0.00	0.00	26.00	7.00
35.235	0.071	20.16	8.14	0.00	0.00	26.00	7.00
35.306	0.359	20.28	41.01	0.00	0.00	26.00	7.00
35.665	0.139	20.28	15.75	0.00	0.00	26.00	7.00
35.804	0.359	20.39	40.42	0.00	0.00	26.00	7.00
36.163	0.138	20.39	15.39	0.00	0.00	26.00	7.00
36.301	0.359	20.50	39.83	0.00	0.00	26.00	7.00
36.660	0.140	20.50	15.36	0.00	0.00	26.00	7.00
36.800	0.359	20.61	39.22	0.00	0.00	26.00	7.00
37.159	0.140	20.61	15.12	0.00	0.00	26.00	7.00
37.299	0.359	20.72	38.60	0.00	0.00	26.00	7.00
37.658	0.142	20.72	15.17	0.00	0.00	26.00	7.00
37.800	0.359	20.83	37.97	0.00	0.00	26.00	7.00
38.159	0.071	20.83	7.42	0.00	0.00	26.00	7.00
38.230	0.073	20.83	7.63	0.00	0.00	26.00	7.00
38.303	0.359	21.03	37.60	0.00	0.00	26.00	7.00

38.662	0.140	21.03	14.68	0.00	0.00	26.00	7.00
38.802	0.359	21.24	37.49	0.00	0.00	26.00	7.00
39.162	0.138	21.24	14.36	0.00	0.00	26.00	7.00
39.299	0.359	21.44	37.36	0.00	0.00	26.00	7.00
39.658	0.137	21.44	14.24	0.00	0.00	26.00	7.00
39.796	0.359	21.64	37.21	0.00	0.00	26.00	7.00
40.155	0.137	21.64	14.18	0.00	0.00	26.00	7.00
40.292	0.359	21.84	37.05	0.00	0.00	26.00	7.00
40.651	0.137	21.84	14.09	0.00	0.00	26.00	7.00
40.788	0.359	22.05	36.88	0.00	0.00	26.00	7.00
41.147	0.133	22.05	13.60	0.00	0.00	26.00	7.00
41.280	0.004	22.05	0.46	0.00	0.00	26.00	7.00
41.284	0.359	22.25	36.63	0.00	0.00	26.00	7.00
41.644	0.139	22.25	14.15	0.00	0.00	26.00	7.00
41.783	0.359	22.44	36.28	0.00	0.00	26.00	7.00
42.142	0.141	22.44	14.22	0.00	0.00	26.00	7.00
42.284	0.359	22.47	35.92	0.00	0.00	26.00	7.00
42.643	0.143	22.47	14.21	0.00	0.00	26.00	7.00
42.786	0.359	22.50	35.55	0.00	0.00	26.00	7.00
43.145	0.141	22.50	13.85	0.00	0.00	26.00	7.00
43.285	0.359	22.53	35.19	0.00	0.00	26.00	7.00
43.645	0.142	22.53	13.79	0.00	0.00	26.00	7.00
43.786	0.054	22.56	5.24	0.00	0.00	26.00	7.00
43.840	0.359	22.56	35.01	0.00	0.00	26.00	7.00
44.199	0.084	22.56	8.26	0.00	0.00	26.00	7.00
44.284	0.359	22.59	35.25	0.00	0.00	26.00	7.00
44.643	0.143	22.59	14.10	0.00	0.00	26.00	7.00
44.786	0.359	22.62	35.52	0.00	0.00	26.00	7.00
45.145	0.144	22.62	14.28	0.00	0.00	26.00	7.00
45.289	0.359	22.64	35.79	0.00	0.00	26.00	7.00
45.648	0.149	22.64	14.93	0.00	0.00	26.00	7.00
45.797	0.359	22.67	36.06	0.00	0.00	26.00	7.00
46.157	0.153	22.67	15.40	0.00	0.00	26.00	7.00
46.309	0.359	23.34	36.30	0.00	0.00	26.00	7.00
46.669	0.136	23.34	13.80	0.00	0.00	26.00	7.00
46.805	0.359	24.04	36.49	0.00	0.00	26.00	7.00
47.164	0.131	24.04	13.31	0.00	0.00	26.00	7.00
47.295	0.295	24.75	30.11	0.00	0.00	26.00	7.00
47.590	0.189	24.75	19.45	0.00	0.00	26.00	7.00
47.779	0.359	25.45	37.65	0.00	0.00	26.00	7.00
48.138	0.134	25.45	14.27	0.00	0.00	26.00	7.00
48.272	0.359	26.16	38.95	0.00	0.00	26.00	7.00
48.631	0.131	26.16	14.46	0.00	0.00	26.00	7.00
48.763	0.359	26.86	40.19	0.00	0.00	26.00	7.00
49.122	0.142	26.86	16.15	0.00	0.00	26.00	7.00
49.264	0.359	27.51	41.39	0.00	0.00	26.00	7.00
49.623	0.160	27.51	18.71	0.00	0.00	26.00	7.00

49.783	0.037	28.11	4.32	0.00	0.00	26.00	7.00
49.820	0.359	28.11	41.89	0.00	0.00	26.00	7.00
50.179	0.158	28.11	18.22	0.00	0.00	26.00	7.00
50.337	0.359	29.81	40.78	0.00	0.00	26.00	7.00
50.697	0.137	29.81	15.35	0.00	0.00	26.00	7.00
50.834	0.359	31.73	39.54	0.00	0.00	26.00	7.00
51.193	0.120	31.73	12.97	0.00	0.00	26.00	7.00
51.313	0.001	33.73	0.12	0.00	0.00	26.00	7.00
51.314	0.359	33.73	38.25	0.00	0.00	22.00	25.00
51.673	0.100	33.73	10.45	0.00	0.00	22.00	25.00
51.773	0.359	35.62	36.98	0.00	0.00	22.00	25.00
52.132	0.125	35.62	12.65	0.00	0.00	22.00	25.00
52.257	0.359	37.43	35.48	0.00	0.00	22.00	25.00
52.616	0.103	37.43	9.92	0.00	0.00	22.00	25.00
52.719	0.359	39.16	33.88	0.00	0.00	22.00	25.00
53.078	0.120	39.16	10.98	0.00	0.00	22.00	25.00
53.198	0.359	40.68	32.06	0.00	0.00	22.00	25.00
53.557	0.136	40.68	11.76	0.00	0.00	22.00	25.00
53.693	0.359	41.96	30.02	0.00	0.00	22.00	25.00
54.052	0.183	41.96	14.67	0.00	0.00	22.00	25.00
54.235	0.359	42.26	27.69	0.00	0.00	22.00	25.00
54.594	0.161	42.26	11.91	0.00	0.00	22.00	25.00
54.755	0.359	42.57	25.40	0.00	0.00	22.00	25.00
55.114	0.147	42.57	9.94	0.00	0.00	22.00	25.00
55.261	0.359	42.89	23.15	0.00	0.00	22.00	25.00
55.620	0.140	42.89	8.58	0.00	0.00	22.00	25.00
55.760	0.359	43.21	20.88	0.00	0.00	22.00	25.00
56.119	0.137	43.21	7.51	0.00	0.00	22.00	25.00
56.256	0.134	43.62	7.13	0.00	0.00	22.00	25.00
56.390	0.359	43.62	17.90	0.00	0.00	22.00	25.00
56.749	0.062	43.62	2.90	0.00	0.00	22.00	25.00
56.811	0.359	43.95	15.75	0.00	0.00	22.00	25.00
57.170	0.260	43.95	10.25	0.00	0.00	22.00	25.00
57.431	0.359	44.25	12.55	0.00	0.00	22.00	25.00
57.790	0.359	44.25	10.67	0.00	0.00	22.00	25.00
58.149	0.155	44.25	4.03	0.00	0.00	22.00	25.00
58.304	0.359	44.42	7.98	0.00	0.00	22.00	25.00
58.663	0.359	44.42	6.09	0.00	0.00	22.00	25.00
59.022	0.359	44.42	4.20	0.00	0.00	22.00	25.00
59.381	0.359	44.42	2.31	0.00	0.00	22.00	25.00
59.741	0.259	44.42	0.49	0.00	0.00	22.00	25.00

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LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
dx(m) : Larghezza concio  
alpha(°) : Angolo pendenza base concio



2.443	24.668	1.253	3.368	0.089	1.5593947341E+002	4.2126966843E+001	3.6540069623E+001	0.569	2.749
2.439	24.690	1.257	3.370	0.138	1.5672791265E+002	4.2426648897E+001	3.6351277062E+001	0.571	2.732
2.371	25.049	1.303	3.420	0.147	1.6910637139E+002	4.7609229014E+001	3.4911031412E+001	0.601	2.491
2.355	25.128	1.316	3.435	0.200	1.7188998336E+002	4.8860825288E+001	3.4086558044E+001	0.608	2.444
2.280	25.488	1.355	3.508	0.218	1.8263456336E+002	5.4309713166E+001	2.9454382869E+001	0.643	2.272
2.250	25.622	1.375	3.542	0.273	1.8658162825E+002	5.6524104785E+001	2.8572745168E+001	0.657	2.214
2.169	25.982	1.421	3.643	0.307	1.9616577381E+002	6.2453418924E+001	2.6476737324E+001	0.697	2.087
2.100	26.274	1.475	3.742	0.376	2.0385233360E+002	6.7712415543E+001	2.5128365106E+001	0.732	1.996
2.015	26.633	1.557	3.888	0.409	2.1235681029E+002	7.4383583113E+001	2.1319281418E+001	0.778	1.904
1.972	26.832	1.605	3.971	0.488	2.1634710543E+002	7.7841899106E+001	1.9979993705E+001	0.802	1.865
1.889	27.192	1.722	4.160	0.496	2.2350412904E+002	8.4736189906E+001	1.7627110661E+001	0.850	1.794
1.858	27.344	1.756	4.225	0.351	2.2604351026E+002	8.7391260293E+001	1.5983651779E+001	0.869	1.768
1.799	27.660	1.784	4.325	0.434	2.3065697038E+002	9.2603268241E+001	1.3296101269E+001	0.906	1.722
1.772	27.826	1.855	4.434	0.669	2.3275232125E+002	9.5125948894E+001	1.1883553247E+001	0.920	1.700
1.719	28.185	2.004	4.676	0.654	2.3645687100E+002	1.0001712007E+002	9.2647351751E+000	0.947	1.660
1.702	28.314	2.047	4.753	0.540	2.3759891411E+002	1.0161807876E+002	8.5444520399E+000	0.955	1.647
1.657	28.673	2.131	4.939	0.507	2.4032147489E+002	1.0577020859E+002	6.1999063941E+000	0.977	1.612
1.646	28.782	2.151	4.990	0.489	2.4095118233E+002	1.0681435187E+002	5.6856543998E+000	0.981	1.603
1.610	29.141	2.217	5.168	0.491	2.4287994542E+002	1.1022705656E+002	4.5442477175E+000	0.997	1.574
1.604	29.200	2.225	5.195	0.434	2.4313967546E+002	1.1071705761E+002	3.9823218263E+000	0.999	1.569
1.599	29.262	2.231	5.221	0.437	2.4336020366E+002	1.1116289470E+002	3.4670268291E+000	1.003	1.565
1.571	29.622	2.268	5.380	0.432	2.4447531131E+002	1.1362903464E+002	2.4463652985E+000	1.026	1.539
1.562	29.754	2.277	5.433	0.404	2.4476703617E+002	1.1436771267E+002	1.9822591901E+000	1.033	1.531
	30.113	2.292	5.578	0.389	2.4526315434E+002	1.1595197404E+002	8.8941922163E-001	1.051	1.511





1.564	35.804	1.946	7.302	0.305	2.3498994641E+002	1.0216875083E+002	-5.6434178062E+000	1.031	1.450
1.591	36.163	1.928	7.417	0.315	2.3257241288E+002	1.0011711906E+002	-6.5909831918E+000	1.021	1.454
1.600	36.301	1.917	7.458	0.320	2.3167175674E+002	9.9374443434E+001	-6.7657639009E+000	1.018	1.456
1.625	36.660	1.901	7.577	0.322	2.2902778349E+002	9.7239277597E+001	-7.0368691443E+000	1.007	1.465
1.634	36.800	1.891	7.619	0.327	2.2806322217E+002	9.6477497568E+001	-7.1297038120E+000	1.003	1.470
1.657	37.159	1.877	7.740	0.327	2.2530009784E+002	9.4347641651E+001	-7.1129385708E+000	0.993	1.484
1.664	37.299	1.867	7.782	0.313	2.2433883542E+002	9.3620184750E+001	-6.9607105499E+000	0.990	1.490
1.683	37.658	1.845	7.896	0.307	2.2177109963E+002	9.1741891555E+001	-6.5188539486E+000	0.981	1.507
1.688	37.800	1.831	7.936	0.304	2.2087921431E+002	9.1110331344E+001	-6.4453202902E+000	0.978	1.512
1.703	38.159	1.807	8.048	0.307	2.1840457186E+002	8.9426344898E+001	-6.2463425367E+000	0.971	1.526
1.705	38.230	1.800	8.068	0.284	2.1797207097E+002	8.9141908792E+001	-6.1689526525E+000	0.970	1.528
1.708	38.303	1.793	8.089	0.321	2.1751961617E+002	8.8851773215E+001	-6.3622598886E+000	0.969	1.530
1.720	38.662	1.773	8.207	0.322	2.1498148388E+002	8.7270577533E+001	-6.7188466922E+000	0.961	1.542
1.725	38.802	1.762	8.250	0.358	2.1405692747E+002	8.6718914253E+001	-7.0054754535E+000	0.958	1.546
1.738	39.162	1.758	8.385	0.372	2.1115256649E+002	8.5048326952E+001	-7.7850901843E+000	0.950	1.559
1.742	39.299	1.754	8.435	0.385	2.1009598740E+002	8.4461917681E+001	-7.9057712528E+000	0.947	1.563
1.755	39.658	1.754	8.577	0.387	2.0703526910E+002	8.2795816695E+001	-8.0573949282E+000	0.939	1.576
1.759	39.796	1.751	8.627	0.391	2.0595446650E+002	8.2221057903E+001	-8.1232747380E+000	0.937	1.580
1.773	40.155	1.752	8.771	0.392	2.0280811964E+002	8.0568961134E+001	-8.2886748319E+000	0.929	1.594
1.778	40.292	1.748	8.821	0.392	2.0169588791E+002	7.9993552905E+001	-8.3345350365E+000	0.927	1.599
1.793	40.651	1.748	8.965	0.382	1.9848993656E+002	7.8348545361E+001	-7.8803031352E+000	0.919	1.613
1.797	40.788	1.739	9.011	0.353	1.9746565073E+002	7.7830669487E+001	-7.6871950171E+000	0.917	1.618
1.812	41.147	1.723	9.140	0.350	1.9451102798E+002	7.6344038365E+001	-7.5882770654E+000	0.911	1.633
	41.280	1.712	9.183	0.320	1.9353486132E+002	7.5855743391E+001	-7.7805838512E+000	0.908	1.638



1.587	46.805	1.815	11.586	0.526	1.4093128732E+002	5.5175193824E+001	-1.1272450388E+001	0.593	1.707
1.514	47.164	1.850	11.781	0.533	1.3645481570E+002	5.3841424544E+001	-1.1957089200E+001	0.574	1.670
1.490	47.295	1.858	11.847	0.576	1.3491575674E+002	5.3383429334E+001	-1.2617282252E+001	0.567	1.658
1.430	47.590	1.901	12.027	0.600	1.3062550006E+002	5.2075545755E+001	-1.4358553832E+001	0.550	1.624
1.396	47.779	1.925	12.138	0.621	1.2792808226E+002	5.1244388766E+001	-1.4865772000E+001	0.533	1.604
1.334	48.138	1.983	12.367	0.623	1.2217019178E+002	4.9412164423E+001	-1.5317312765E+001	0.501	1.564
1.315	48.272	1.998	12.445	0.619	1.2015605895E+002	4.8758323485E+001	-1.5603398043E+001	0.489	1.552
1.267	48.631	2.048	12.672	0.618	1.1401961032E+002	4.6687371066E+001	-1.6531522437E+001	0.457	1.516
1.252	48.763	2.060	12.748	0.626	1.1187687678E+002	4.5942366498E+001	-1.7168949225E+001	0.446	1.504
1.216	49.122	2.108	12.979	0.628	1.0488480115E+002	4.3408028113E+001	-1.9211184511E+001	0.412	1.472
1.205	49.264	2.121	13.063	0.607	1.0216772153E+002	4.2393188293E+001	-1.9619210552E+001	0.399	1.462
1.180	49.623	2.154	13.283	0.587	9.4658875109E+001	3.9503477159E+001	-1.9707607809E+001	0.364	1.440
1.173	49.783	2.155	13.368	0.530	9.1589959993E+001	3.8292712116E+001	-1.9862712044E+001	0.350	1.434
1.171	49.820	2.155	13.388	0.529	9.0854117531E+001	3.7998028216E+001	-2.0094149654E+001	0.346	1.432
1.158	50.179	2.153	13.578	0.513	8.3379807995E+001	3.4956984816E+001	-2.0161378607E+001	0.322	1.423
1.155	50.337	2.144	13.653	0.492	8.0235479505E+001	3.3651433664E+001	-2.0327471081E+001	0.312	1.420
1.147	50.697	2.118	13.832	0.490	7.2566069229E+001	3.0434643088E+001	-2.0861830398E+001	0.286	1.419
1.144	50.834	2.103	13.896	0.471	6.9729199300E+001	2.9229689188E+001	-2.0791765015E+001	0.275	1.419
1.138	51.193	2.051	14.066	0.465	6.2150827739E+001	2.6000695113E+001	-2.0174146452E+001	0.248	1.424
1.135	51.313	2.030	14.119	0.443	5.9770664958E+001	2.4978792003E+001	-2.1464330120E+001	0.240	1.427
1.528	51.314	2.030	14.120	0.476	5.9747448636E+001	2.4968796416E+001	-2.1476814655E+001	0.239	1.427
1.524	51.673	1.961	14.291	0.474	5.2264945251E+001	2.1728231679E+001	-2.0281031451E+001	0.217	1.434
1.522	51.773	1.941	14.337	0.502	5.0257984027E+001	2.0861321297E+001	-2.0454206394E+001	0.211	1.434
	52.132	1.867	14.521	0.504	4.2489223257E+001	1.7527816321E+001	-2.0217012140E+001	0.185	1.426



0.624	58.149	0.335	18.427	0.835	-2.8210766891E+001	-2.4398930467E+000	4.7925659635E+000	0.166	0.698
0.603	58.304	0.304	18.547	0.774	-2.7349224025E+001	-2.0937908917E+000	6.3627297669E+000	0.160	0.694
0.572	58.663	0.229	18.825	0.780	-2.4391864552E+001	-1.2958610610E+000	1.0404761133E+001	0.136	0.709
0.586	59.022	0.161	19.108	0.820	-1.9874955113E+001	-6.3177693218E-001	1.4956779136E+001	0.098	0.782
0.863	59.381	0.115	19.414	0.822	-1.3647649680E+001	-1.9613817442E-001	1.8913857823E+001	0.052	1.074
3.779	59.741	0.048	19.699	0.822	-6.2881694378E+000	-4.4164755527E-002	2.2719397297E+001	0.051	3.733

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 LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
 ht (m) : Altezza linea di thrust da nodo sinistro base concio  
 yt (m) : coordinata Y linea di trust  
 yt' (-) : gradiente pendenza locale linea di trust  
 E(x) (kN/m) : Forza Normale interconcio  
 T(x) (kN/m) : Forza Tangenziale interconcio  
 E' (kN) : derivata Forza normale interconcio  
 Rho(x) (-) : fattore mobilizzazione resistenza al taglio verticale interconcio ZhU et al.(2003)  
 FS\_qFEM(x) (-) : fattore di sicurezza locale stimato (locale in X) by qFEM  
 FS\_srmFEM(x) (-) : fattore di sicurezza locale stimato (locale in X) by SRM Procedure  
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TABELLA SFORZI DI TAGLIO DISTRIBUITI LUNGO SUPERFICIE INDIVIDUATA CON MINOR FS

X (m)	dx (m)	dI (m)	alpha (°)	TauStress (kPa)	TauF (kN/m)	TauStrength (kPa)	TauS (kN/m)
20.088	0.359	0.414	-29.916	-1.182	-0.490	8.380	3.473
20.448	0.359	0.414	-29.916	-3.546	-1.469	11.307	4.685
20.807	0.359	0.414	-29.916	-5.910	-2.449	15.711	6.511
21.166	0.359	0.414	-29.916	-8.274	-3.429	21.241	8.802
21.525	0.359	0.414	-29.916	-10.638	-4.408	27.892	11.558
21.884	0.124	0.143	-29.916	-12.228	-1.750	32.164	4.603
22.008	0.359	0.409	-28.457	-13.248	-5.412	37.030	15.128
22.368	0.359	0.409	-28.457	-15.430	-6.304	39.773	16.249
22.727	0.147	0.167	-28.457	-16.967	-2.836	42.514	7.107
22.874	0.306	0.337	-24.745	-16.190	-5.460	44.838	15.122
23.180	0.246	0.270	-24.745	-17.717	-4.792	48.161	13.026
23.426	0.359	0.380	-19.258	-15.205	-5.785	51.869	19.734
23.785	0.071	0.076	-19.258	-16.151	-1.223	53.689	4.064
23.856	0.359	0.367	-11.871	-9.432	-3.462	56.080	20.583

24.215	0.094	0.096	-11.871	-9.892	-0.945	58.051	5.547
24.309	0.359	0.361	-5.694	-2.760	-0.996	58.414	21.085
24.668	0.022	0.022	-5.694	-2.848	-0.062	59.740	1.298
24.690	0.359	0.359	0.724	5.608	2.014	58.988	21.189
25.049	0.080	0.080	0.724	5.764	0.458	60.939	4.846
25.128	0.359	0.361	5.643	12.673	4.574	58.930	21.269
25.488	0.135	0.135	5.643	12.980	1.758	60.564	8.204
25.622	0.359	0.363	8.811	17.666	6.421	59.285	21.548
25.982	0.292	0.296	8.811	18.125	5.359	61.000	18.035
26.274	0.359	0.365	9.949	20.190	7.363	61.386	22.385
26.633	0.199	0.202	9.949	20.592	4.169	61.986	12.550
26.832	0.359	0.366	11.363	23.024	8.435	62.147	22.768
27.192	0.153	0.156	11.363	23.394	3.639	62.485	9.720
27.344	0.316	0.324	12.902	25.952	8.412	61.535	19.946
27.660	0.166	0.170	12.902	26.728	4.556	62.770	10.701
27.826	0.359	0.371	14.498	30.911	11.468	64.321	23.863
28.185	0.128	0.133	14.498	32.623	4.329	67.165	8.913
28.314	0.359	0.374	15.945	36.709	13.712	68.599	25.625
28.673	0.109	0.113	15.945	38.425	4.353	71.146	8.059
28.782	0.359	0.376	17.390	42.639	16.048	72.417	27.256
29.141	0.059	0.062	17.390	44.229	2.730	74.713	4.612
29.200	0.062	0.065	17.390	44.436	2.909	74.917	4.904
29.262	0.359	0.379	18.723	46.627	17.683	73.309	27.802
29.622	0.132	0.140	18.723	46.444	6.492	72.977	10.200
29.754	0.359	0.382	19.908	48.211	18.417	71.433	27.288
30.113	0.168	0.179	19.908	47.958	8.586	71.063	12.723
30.282	0.359	0.382	19.912	47.712	18.227	70.698	27.008
30.641	0.159	0.169	19.912	47.464	8.019	70.338	11.883
30.800	0.359	0.382	19.916	47.222	18.040	69.983	26.735
31.159	0.149	0.158	19.916	46.978	7.440	69.636	11.028
31.308	0.359	0.382	19.920	46.741	17.857	69.292	26.472
31.667	0.146	0.155	19.920	46.499	7.224	68.957	10.712
31.813	0.359	0.382	19.924	46.263	17.674	68.619	26.215
32.172	0.138	0.147	19.924	46.024	6.779	68.299	10.060
32.311	0.359	0.382	19.928	45.791	17.495	67.963	25.966
32.670	0.142	0.151	19.928	45.550	6.870	67.646	10.202
32.811	0.359	0.382	19.932	45.316	17.313	67.311	25.717
33.171	0.140	0.149	19.932	45.076	6.732	66.998	10.006
33.311	0.359	0.382	19.936	44.841	17.133	66.665	25.471
33.670	0.142	0.151	19.936	44.600	6.726	66.352	10.006
33.812	0.359	0.382	19.940	44.365	16.951	66.017	25.224
34.171	0.139	0.148	19.940	44.125	6.516	65.704	9.702
34.310	0.359	0.382	20.052	44.049	16.842	65.289	24.964
34.669	0.140	0.149	20.052	43.803	6.510	64.970	9.656
34.809	0.067	0.072	20.164	43.865	3.149	64.749	4.648
34.876	0.359	0.383	20.164	43.612	16.687	55.821	21.359
35.235	0.071	0.075	20.164	43.350	3.272	55.521	4.191

35.306	0.359	0.383	20.276	43.246	16.559	55.205	21.138
35.665	0.139	0.148	20.276	42.937	6.358	54.850	8.123
35.804	0.359	0.383	20.388	42.782	16.393	54.519	20.890
36.163	0.138	0.147	20.388	42.468	6.242	54.151	7.959
36.301	0.359	0.383	20.500	42.306	16.223	53.781	20.623
36.660	0.140	0.149	20.500	41.985	6.256	53.395	7.956
36.800	0.359	0.384	20.611	41.812	16.045	53.016	20.344
37.159	0.140	0.149	20.611	41.485	6.186	52.607	7.844
37.299	0.359	0.384	20.722	41.302	15.861	52.191	20.042
37.658	0.142	0.152	20.722	40.967	6.231	51.768	7.874
37.800	0.359	0.384	20.832	40.773	15.669	51.363	19.739
38.159	0.071	0.076	20.832	40.481	3.061	50.996	3.856
38.230	0.073	0.078	20.832	40.425	3.147	50.934	3.964
38.303	0.359	0.385	21.033	40.635	15.637	50.808	19.552
38.662	0.140	0.150	21.033	40.576	6.106	50.706	7.630
38.802	0.359	0.385	21.235	40.769	15.710	50.592	19.495
39.162	0.138	0.148	21.235	40.702	6.016	50.486	7.462
39.299	0.359	0.386	21.439	40.885	15.777	50.336	19.423
39.658	0.137	0.147	21.439	40.809	6.013	50.214	7.399
39.796	0.359	0.386	21.642	40.979	15.835	50.059	19.343
40.155	0.137	0.148	21.642	40.893	6.035	49.930	7.368
40.292	0.359	0.387	21.844	41.050	15.885	49.765	19.257
40.651	0.137	0.147	21.844	40.955	6.041	49.584	7.313
40.788	0.359	0.388	22.046	41.099	15.926	49.408	19.146
41.147	0.133	0.143	22.046	40.995	5.872	49.251	7.055
41.280	0.004	0.005	22.046	40.965	0.197	49.245	0.237
41.284	0.359	0.388	22.246	41.065	15.936	49.047	19.033
41.644	0.139	0.151	22.246	40.872	6.155	48.825	7.352
41.783	0.359	0.389	22.443	40.905	15.896	48.570	18.875
42.142	0.141	0.153	22.443	40.702	6.230	48.320	7.396
42.284	0.359	0.389	22.471	40.531	15.754	48.140	18.711
42.643	0.143	0.155	22.471	40.325	6.232	47.879	7.399
42.786	0.359	0.389	22.500	40.152	15.610	47.691	18.541
43.145	0.141	0.152	22.500	39.945	6.082	47.425	7.221
43.285	0.359	0.389	22.529	39.771	15.465	47.234	18.367
43.645	0.142	0.153	22.529	39.563	6.061	46.917	7.187
43.786	0.054	0.058	22.558	39.514	2.304	46.832	2.731
43.840	0.359	0.389	22.558	39.602	15.402	46.924	18.250
44.199	0.084	0.091	22.558	39.738	3.635	46.999	4.299
44.284	0.359	0.389	22.587	39.907	15.524	47.172	18.351
44.643	0.143	0.155	22.587	40.060	6.209	47.277	7.328
44.786	0.359	0.389	22.616	40.245	15.659	47.463	18.468
45.145	0.144	0.156	22.616	40.398	6.295	47.592	7.416
45.289	0.359	0.389	22.645	40.582	15.794	47.761	18.587
45.648	0.149	0.162	22.645	40.735	6.588	47.881	7.744
45.797	0.359	0.389	22.673	40.919	15.928	48.071	18.712
46.157	0.153	0.166	22.673	41.072	6.803	48.175	7.980

46.309	0.359	0.391	23.345	41.972	16.419	47.961	18.762
46.669	0.136	0.148	23.345	42.091	6.241	48.033	7.123
46.805	0.359	0.393	24.042	42.968	16.899	47.787	18.795
47.164	0.131	0.143	24.042	43.054	6.163	47.835	6.847
47.295	0.295	0.325	24.753	43.883	14.273	47.618	15.488
47.590	0.189	0.208	24.753	44.233	9.219	47.930	9.989
47.779	0.359	0.398	25.451	45.887	18.253	48.448	19.272
48.138	0.134	0.148	25.451	46.694	6.920	49.118	7.279
48.272	0.359	0.400	26.165	48.248	19.308	49.529	19.821
48.631	0.131	0.146	26.165	49.027	7.168	50.177	7.336
48.763	0.359	0.403	26.858	50.527	20.342	50.668	20.399
49.122	0.142	0.159	26.858	51.297	8.175	51.327	8.180
49.264	0.359	0.405	27.515	52.745	21.361	51.721	20.946
49.623	0.160	0.180	27.515	53.515	9.658	52.232	9.426
49.783	0.037	0.042	28.107	54.430	2.268	52.169	2.174
49.820	0.359	0.407	28.107	54.007	21.992	51.947	21.153
50.179	0.158	0.179	28.107	53.322	9.563	51.350	9.210
50.337	0.359	0.414	29.811	54.185	22.430	49.804	20.616
50.697	0.137	0.158	29.811	53.405	8.446	49.175	7.777
50.834	0.359	0.422	31.729	54.098	22.845	47.308	19.977
51.193	0.120	0.141	31.729	53.206	7.495	46.541	6.556
51.313	0.001	0.001	33.732	54.336	0.071	45.248	0.059
51.314	0.359	0.432	33.732	53.673	23.181	57.348	24.768
51.673	0.100	0.120	33.732	52.829	6.334	56.761	6.805
51.773	0.359	0.442	35.624	52.900	23.375	55.477	24.514
52.132	0.125	0.154	35.624	51.870	7.995	54.555	8.408
52.257	0.359	0.452	37.426	51.473	23.280	53.079	24.007
52.616	0.103	0.129	37.426	50.358	6.510	52.337	6.766
52.719	0.359	0.463	39.160	49.644	22.996	50.970	23.611
53.078	0.120	0.154	39.160	48.353	7.452	50.177	7.733
53.198	0.359	0.474	40.680	47.252	22.380	48.823	23.124
53.557	0.136	0.179	40.680	45.790	8.213	48.044	8.617
53.693	0.359	0.483	41.956	44.378	21.434	46.136	22.283
54.052	0.183	0.245	41.956	42.660	10.472	45.055	11.060
54.235	0.359	0.485	42.255	40.940	19.867	43.944	21.325
54.594	0.161	0.218	42.255	39.263	8.543	42.709	9.293
54.755	0.359	0.488	42.570	37.578	18.327	41.664	20.320
55.114	0.147	0.200	42.570	35.918	7.172	40.412	8.070
55.261	0.359	0.490	42.889	34.245	16.788	39.415	19.322
55.620	0.140	0.191	42.889	32.581	6.222	38.325	7.319
55.760	0.359	0.493	43.211	30.899	15.227	37.306	18.385
56.119	0.137	0.187	43.211	29.218	5.478	36.330	6.812
56.256	0.134	0.185	43.622	28.288	5.236	35.711	6.610
56.390	0.359	0.496	43.622	26.478	13.137	34.797	17.265
56.749	0.062	0.086	43.622	24.898	2.132	34.017	2.913
56.811	0.359	0.499	43.946	23.293	11.620	33.174	16.549
57.170	0.260	0.361	43.946	20.935	7.565	32.093	11.597



57.431	0.359	0.501	44.251	18.552	9.303	30.963	15.526
57.790	0.359	0.501	44.251	15.778	7.912	29.585	14.835
58.149	0.155	0.217	44.251	13.793	2.987	28.833	6.243
58.304	0.359	0.503	44.417	11.794	5.930	28.077	14.119
58.663	0.359	0.503	44.417	8.999	4.525	27.263	13.709
59.022	0.359	0.503	44.417	6.204	3.120	26.594	13.373
59.381	0.359	0.503	44.417	3.409	1.714	26.010	13.080
59.741	0.259	0.362	44.417	1.006	0.364	25.273	9.147

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LEGENDA SIMBOLI

X(m) : Ascissa sinistra concio  
dx(m) : Larghezza concio  
dl(m) : lunghezza base concio  
alpha(°) : Angolo pendenza base concio  
TauStress(kPa) : Sforzo di taglio su base concio  
TauF (kN/m) : Forza di taglio su base concio  
TauStrength(kPa) : Resistenza al taglio su base concio  
TauS (kN/m) : Forza resistente al taglio su base concio

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